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July 7, 2014

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**Subject: Final Trip Report for Indoor Ambient Air Monitoring, Vapor Intrusion Sampling, Soil Gas Sampling, and Assessment Activities Conducted at the Michigan Gas Utilities Site – Revision 2  
EPA Contract No. EP-S5-13-01  
Technical Direction Document No. S05-0001-1405-006  
Document Tracking No. 0018**

Dear Mr. Lippert:

Tetra Tech, Inc. (Tetra Tech) is submitting the Final Trip Report for the Indoor Ambient Air Monitoring, Vapor Intrusion Sampling, Soil Gas Sampling, and Assessment Activities conducted at the Michigan Gas Utilities (MGU) site in May 2014. This report summarizes the findings of field activities conducted based on the Abbreviated Sampling and Analysis Plan for the site; specifically, the sampling at 78 W. Chicago Street, Coldwater, Michigan.

If you have any questions regarding this report, please contact me at (312) 201-7739.

Sincerely,

A handwritten signature in blue ink that reads 'K Scott'.

Kevin Scott,  
Project Manager

Enclosure

cc: TDD File

**FINAL TRIP REPORT  
FOR  
THE INDOOR AMBIENT AIR MONITORING, VAPOR INTRUSION SAMPLING, SOIL GAS  
SAMPLING, AND ASSESSMENT ACTIVITIES CONDUCTED AT THE  
MICHIGAN GAS UTILITIES SITE  
78 W. CHICAGO STREET,  
COLDWATER, BRANCH COUNTY, MICHIGAN**

REVISION 2

**U.S. Environmental Protection Agency**  
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A	MICHIGAN GAS UTILITIES CORPORATION FORMER CHICAGO STREET MGP REMEDIAL INVESTIGATION III SUPPLEMENTAL REPORT, PREPARED BY PESCADOR, LLC
B	LABORATORY ANALYTICAL DATA PACKAGE

## 1.0 INTRODUCTION

Under the Superfund Technical Assessment and Response Team 4 (START 4) Contract No. EP-S5-13-01, U.S. Environmental Protection Agency (EPA) Region 5 tasked Tetra Tech, Inc. (Tetra Tech) to conduct a screening assessment for vapor intrusion at the commercial building at 78 W. Chicago Street, Coldwater, Michigan, as part of the Michigan Gas Utilities (MGU) site, located in Coldwater Michigan. A map showing the location of the site is included in Figure 1, and the layout of the site is displayed in Figure 2 presented in Appendix A.

On May 14, 2014, Tetra Tech began the assessment by conducting indoor air quality monitoring using handheld air monitoring instrumentation. On May 15 and 16, 2014, Tetra Tech collected sub-slab soil gas and indoor and outdoor air samples from those locations where vapor intrusion was suspected based on initial assessment results, and collected soil gas samples from locations behind the building.

Analytical results from the sampling event were compared to EPA Risk-Based Screening Levels (RSL) for ambient air. Specifically, the results were compared to the EPA May 2014 RSL industrial and residential air supporting tables with a carcinogenic target risk (TR) equal to a one-in-a-million ( $10^{-6}$ ) individual excess cancer risk for carcinogens and a hazard quotient (HQ) of 1 for non-carcinogens (TR=1E-6, HQ=0.1).

Analytical results for the soil gas samples were compared to the RSL divided by a factor of 10, based on the EPA's Vapor Intrusion Screening Level calculator (EPA 2014). The target soil gas concentration corresponding to a chemical's target indoor air concentration at the selected target cancer risk or hazard quotient is calculated by dividing the indoor air concentration by the generic attenuation factor of 0.1. Therefore the sub-slab soil gas screening values are 10 times higher than the indoor air and ambient air RSLs due to the attenuation factor of 0.1. The calculated soil gas comparison values will be referenced as screening levels (SL) throughout this document.

Bromodichloromethane, chloroform, and tetrachloroethene were detected in sub-slab samples at concentrations exceeding the SLs for industrial soil gas. In addition, benzene was detected at concentrations exceeding the SLs for residential soil gas at one location, and the ambient air RSL in the outdoor air sample. Based on this information, Tetra Tech recommends that the data collected from this sampling event be evaluated as part of a risk assessment to determine whether remediation will be necessary.

For detailed description of site background and previous assessment results, refer to Michigan Gas Utilities Corporation Former Chicago Street MGP Remedial Investigation III Supplemental Report, prepared by Pescador, LLC dated April 30, 2014 (Attachment A).

This trip report discusses the field investigation in Section 2.0, summarizes the findings and data evaluation in Section 3.0, and presents conclusions and recommendations in Section 4.0. All references cited in this report are listed after the text.

## **2.0 FIELD INVESTIGATION**

This section summarizes the scope of work and describes the sampling activities conducted during the vapor intrusion evaluation at the MGU site.

### **2.1 SCOPE OF WORK**

Tetra Tech performed the following tasks during this assessment:

- Conducted written logbook documentation activities (included in Appendix B) in accordance with Tetra Tech Standard Operating Procedure (SOP) No. 024, “Recording of Notes in Field Logbook” (Tetra Tech 2008)
- Collected weather data prior to and during the monitoring activities, including temperature, barometric pressure, precipitation, and predominant wind direction and average speed (Appendix C)
- Prior to the air monitoring assessment, instructed the building owner to remove any possible sources that may contain target compounds of interest, and provided boxes for these items, if requested
- Conducted indoor ambient (background) air monitoring with direct-reading instruments to determine benzene, oxygen, carbon dioxide, and total volatile organic compound (VOC) concentrations, and flammable (explosive) limits of combustible gas in indoor air prior to selection and installation of indoor sub-slab sampling ports
- Performed monitoring in accordance with direct reading instrument manufacturers specifications and Tetra Tech SOP No. 003, “Organic Vapor Air Monitoring” (Tetra Tech 2009).
- Conducted indoor air quality monitoring in accordance Tetra Tech SOP No. 003, “Organic Vapor Air Monitoring” (Tetra Tech 2009) using direct-reading instruments to determine whether benzene, oxygen, carbon dioxide, and total VOC concentrations, and flammable (explosive) limits of combustible gas were present inside the building’s basement. The assessment survey focused on the area within the building’s basement that has the potential for gas accumulation and/or preferential pathways of gas (in other words, in confined areas of basement and locations noted by the property owner to have had notable odors).

Tetra Tech assigned identifiers for all monitoring locations according to the following naming convention: MGU-AA-##, where

- MGU = Site ID (i.e. Michigan Gas Utilities)
- AA = Matrix, indoor or outdoor ambient air (“OA” for outdoor ambient air [background], “IA” for indoor ambient air, “SG” or “SV” for soil gas or soil vapor)
- ## = Station location (01, 02, 03, etc.)

The general location of the building that was subject to air monitoring is shown on Figure 2 in Appendix A. The specific locations of the indoor air sampling and sub-slab gas sampling are shown on Figure 3 in Appendix A. The specific locations of the outdoor air sampling and soil gas sampling are shown on Figure 4 in Appendix A.

Tetra Tech used the following hand-held, direct-reading instruments to perform the assessment:

- Rae Systems UltraRAE 3000 with Benzene SEP tube (photoionization detector) for total VOC screening and benzene.
- Rae Systems MultiRAE Pro (multiple gas meters with photoionization detector) for measuring total VOCs, oxygen, % LEL (lower explosive limit), hydrogen sulfide, and carbon monoxide.

Field work was conducted in accordance with the Tetra Tech Abbreviated Sampling and Analysis Plan (SAP) for the site and the contract Quality Assurance Project Plan (QAPP (Tetra Tech 2014a).

## 2.2 SAMPLING ACTIVITIES

This section describes sub-slab soil gas, indoor air, outdoor ambient air, and soil vapor gas sampling conducted at the MGU site during the May 2014 sampling event.

### 2.2.1 Sub-Slab Soil Gas Sampling (MGU-SV-1, MGU-SV-2, MGU-SV-3, MGU-SV-4, MGU-SV-5)

Sub-slab soil gas samples were collected at the basement level of the building. A total of five sub-slab soil gas samples were collected, including four samples and one duplicate sample. A summary of the samples collected is presented in Table 1. Sub-slab gas samples were collected according to the SOPs included in the Abbreviated SAP (Tetra Tech 2014b). Sub-slab gas sampling locations are shown on Figure 3.

For sample collection, Tetra Tech drilled holes through the basement slab of the structure to approximately 3 inches below the slab in accordance with EPA Environmental Response Team (ERT) SOP No. 2082, “Construction and Installation of Permanent Sub-Slab Soil Gas Wells” (EPA 2007a). Tetra Tech personnel inserted a sub-slab soil gas sampling port, constructed of stainless-steel tubing and Swagelok fittings and connectors, into each drilled hole and sealed the open area around the probe with modeling clay and concrete. A cross-section diagram of the soil gas sampling probe was included in the SOP.

Prior to collecting soil gas samples, Tetra Tech personnel conducted a helium leak test on one sample port and connective tubing to ensure that indoor air was not being drawn into the sample. The area surrounding the sample port was covered and sealed with a plastic bucket and helium gas was injected through and into the bucket via sample tubing until an elevated concentration of helium was reached. A helium meter was used to measure the concentration of helium under and inside the bucket. A sub-slab air sample was then drawn from the sample port into a Tedlar bag and analyzed with a portable helium meter. The integrity of the sub-slab seal was confirmed if no helium was detected inside the Tedlar bag. The results of the leak test indicated that no leaks were present.

Soil gas samples were collected in laboratory-supplied, pre-evacuated, 6-liter Summa canisters fitted with flow regulators that were calibrated to collect an appropriate volume of soil gas or air over a 24-hour period (approximately 3.2 milliliters per minute [mL/min]) in accordance with ERT SOP No. 1704, “Summa Canister Sampling,” (EPA 1995). Tetra Tech recorded all sampling data—including Summa canister and flow regulator identification numbers, starting and ending sampling dates and times, starting and ending vacuums, and a sketch showing canister location within the residence—on air sampling data sheets, which are included in Appendix D).

Sample labels and tags containing the unique sample identifier and date and time of sampling were attached to each Summa canister following canister placement. Sampling data—including sample analyses, station location, and sample collection start and stop times and dates—were recorded on laboratory chain-of-custody forms. A copy of the sample chain-of-custody record is provided in Appendix E. Sampling locations were photographed and documented during canister placement or retrieval to record sampling conditions and locations. A copy of the photographic documentation log is provided in Appendix F. The samples were submitted to an EPA-certified laboratory (Spectrum Analytical, Inc. in Agawam, Massachusetts) for VOC analyses.

### **2.2.2 Indoor Air Sampling (MGU-IA-1, MGU-IA-2)**

Tetra Tech collected two indoor air samples from the basement of the investigated structure concurrently with the sub-slab samples. The locations of the indoor air samples are shown on Figure 3 presented in Appendix A.

All indoor air samples were collected concurrently with the sub-slab soil gas sampling. The locations of the indoor air samples were established during the sampling event based on visual observations of the structure and input from the property owner. Indoor air samples were collected according to EPA Region

5 Operating Procedure No. SESDPROC-303-R1, “Ambient Air Sampling” (EPA 2007b) and ERT SOP No. 1704, “Summa Canister Sampling,” (EPA 1995).

Indoor air sampling activities were conducted in three steps: (1) conducting indoor air quality monitoring with handheld air monitoring instruments; (2) placing Summa canisters inside and outside the structure; and (3) retrieving the Summa canisters from the structure.

Tetra Tech placed two 6-liter Summa canisters (one sample and one duplicate sample) affixed with a pressure regulator and 24-hour continuous-flow orifice on the Summa canisters in the basement of the structure.

Samples were collected in laboratory-supplied, pre-evacuated, 6-liter Summa canisters fitted with flow regulators that were calibrated to collect soil gas/air over a 24-hour period (approximately 3.2 mL/min) in accordance with ERT SOP No. 1704, “Summa Canister Sampling,” (EPA 1995). Sampling data—including Summa canister and flow regulator identification numbers, starting and ending sample dates and times, starting and ending vacuums, and a sketch showing canister location within the structure—were recorded on an air sampling data sheet, which is included in Appendix D.

Sample labels and tags containing the unique sample identifier and date and time of sampling were attached to each Summa canister following canister placement. Sampling data—including sample analyses, station location, sample collection start and stop times and dates—were recorded on laboratory chain-of-custody forms. A copy of the laboratory chain-of-custody record is provided in Appendix E. Sampling locations were photographed and documented during canister placement or retrieval to record sampling conditions and locations. A copy of the photographic documentation log is provided in Appendix F. The samples were submitted to an EPA-certified laboratory (Spectrum Analytical, Inc., Agawam, Massachusetts) for VOC analyses.

### **2.2.3 Ambient Outdoor Air Sampling (MGU-OA-1)**

Tetra Tech collected one outdoor air sample to characterize ambient outdoor air quality conditions. The ambient outdoor air sample was collected concurrently with the indoor air samples. The location of the outdoor air sample is shown on Figure 4 in Appendix A. The location of the outdoor air sample was determined at the time of the sampling event and did not exceed a distance of 25 feet from the building footprint. The outdoor air sample was collected according to EPA Region 5 Operating Procedure No. SESDPROC-303-R1, “Ambient Air Sampling” (EPA 2007b) and ERT SOP No. 1704, “Summa Canister Sampling,” (EPA 1995).

Tetra Tech recorded weather data—including wind speed and direction, barometric pressure, and temperature—during the timeframes of the sampling events, based on information collected from an Internet weather service, Weather Underground ([www.wunderground.com](http://www.wunderground.com)). Weather information is included in Appendix C.

Samples were collected in laboratory-supplied, pre-evacuated, Summa canisters fitted with flow regulators that were calibrated to collect soil gas/air over a 24-hour period (approximately 3.2 mL/min) in accordance with ERT SOP No. 1704, “Summa Canister Sampling,” (EPA 1995).

Sample labels and tags containing the unique sample identifier and date and time of sampling were attached to each Summa canister following canister placement. Tetra Tech recorded sampling data—including sample analyses, station location, sample collection start and stop times and dates--on chain-of-custody forms. A copy of the laboratory chain-of-custody record is provided in Appendix E. Sampling locations were photographed and documented during canister placement or retrieval to record sampling conditions and locations. A copy of the photographic documentation log is provided in Appendix F. The samples were submitted to an EPA-certified laboratory (Spectrum Analytical, Inc., Agawam, Massachusetts) for VOC analyses.

#### **2.2.4 Outdoor Soil Gas Sampling (MGU-SG-1, MGU-SG-2, MGU-SG-3)**

Tetra Tech collected three outdoor soil gas samples to characterize the soil gas conditions surrounding the property. Soil gas sampling locations are shown on Figure 4 in Appendix A. Sampling locations were determined at the time of the sampling event. The samples were collected according to EPA Region 5 EPA ERT SOP No. 2042, “Soil Gas Sampling” (EPA 2007c), and ERT SOP No. 2102, “Tedlar Bag Sampling,” (EPA 1995a).

Tetra Tech recorded weather data—including wind speed and direction, barometric pressure, and temperature—during the timeframes of the sampling events, based on information collected from an Internet weather service, Weather Underground ([www.wunderground.com](http://www.wunderground.com)). Weather information is included in Appendix C.

Samples were collected in Tedlar bags using a vacuum pump from sampling points installed to approximately 4 feet below ground surface (bgs) using an AMS soil gas sampling point. Samples were collected in accordance with ERT SOP No. 2102, “Tedlar Bag Sampling” (EPA 1995b).

Sample labels containing the unique sample identifier and date and time of sampling were attached to each Tedlar bag following sample collection. Sampling data—including sample analyses, station location,

sample collection times and dates—were recorded on chain-of-custody forms. A copy of the laboratory chain-of-custody record is provided in Appendix E. Sampling locations were photographed and documented during sample collection to record sampling conditions and locations. A copy of the photographic documentation log is provided in Appendix F. The samples were submitted to an EPA-certified laboratory (Spectrum Analytical, Inc., Agawam, Massachusetts) for VOC analyses.

### 3.0 FINDINGS AND DATA EVALUATION

Table 2 summarizes the data obtained with the direct-reading instruments used at the subject property during assessment activities. Tetra Tech personnel manually recorded these data on a field data sheet or the field logbook (Appendix A).

Indoor air monitoring data were compared against screening concentrations (i.e., action levels) that were established for each of the monitoring parameters. Any indoor air contaminant level higher than its corresponding screening concentration indicated a potential for vapor intrusion, unless another source of vapors could be identified, such as gas leaks, household cleaning products, paints, or varnishes.

All of the data were taken into consideration for determining the potential for vapor intrusion; however, this investigation was focused on VOCs because of the history of the MGU site. Therefore, if any gases are migrating into the structure, VOCs would be most likely detected.

As shown in Table 2, the readings taken at basement level showed low levels of VOCs. Of all the screened parameters, only concentrations of total VOCs were detected, ranging from 0 to 160 parts per billion (ppb) in the ambient air, and 0 to 280 ppb below the slab. Based on this information, there does not appear to be a describable correlation between the sub-slab readings and the ambient air.

Table 3 presents a summary of the VOCs detected in the sub-slab soil gas, outdoor soil gas, and indoor and outdoor ambient air samples. The results are depicted graphically from the sampling locations on Figures 5 and 6 in Appendix A. The laboratory analytical data and validation reports for the samples collected during this assessment are provided in Attachment B. A total of 22 VOCs were detected in the 11 samples analyzed. The highest number of different VOCs was detected in sample MGU-SV-3; however, not all of the VOCs were detected in the corresponding duplicate sample (MGU-SV-2). The average number of different VOCs detected in other samples collected at this property was 11 VOCs per sample. Tetra Tech compared the concentrations of the VOCs detected in the sub-slab soil gas samples and indoor ambient air samples against the corresponding EPA screening levels for each compound. VOCs with concentrations that exceeded their respective SL or RSL were shaded in Table 3.

A total of 22 different VOCs were detected in the five sub-slab soil gas samples. Eight of the 22 VOCs (acetone, Freon 12, Freon 11, ethanol, 1,1,1-trichloroethane, benzene, methylene chloride, and tetrachloroethene) were detected in three sub-slab samples; MG-SV-1, MG-SV-3 (duplicate of MG-SV-4), and MG-SV-5. Two of these eight compounds (benzene and tetrachloroethene) were detected at concentrations above their respective SLs. Sub-slab samples MGU-SV-1 and MGU-SV-5 had three different VOCs (chloroform, bromodichloromethane, and tetrachloroethene) exceeding their respective industrial SL values. Sample MGU-SV-3 had two different VOCs (benzene and tetrachloroethene) detected in excess of their respective residential SL (benzene) and industrial SL (tetrachloroethene).

Four different VOCs (acetone, ethanol, methylene chloride, and hexane) were detected in both indoor ambient air samples. None of the VOCs was detected above the RSL value.

Ten different VOCs were detected in the outdoor ambient air sample. One of the ten VOCs (benzene) was detected at a concentration exceeding its respective RSL of 0.36 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ) for residential air. However, benzene did not exceed the RSL for industrial air ( $1.6 \mu\text{g}/\text{m}^3$ ), detected at concentration of  $0.41 \mu\text{g}/\text{m}^3$ .

Eight different VOCs were detected in each of the three soil gas samples (MGU-SG-1, MGU-SG-2, and MGU-SG-3), with acetone, chloromethane, ethanol, methylene chloride, isopropyl alcohol, and toluene detected in all three samples; and Freon 12 and hexane detected in specific samples only (Freon 12 in MGU-SG-1 and hexane in MGU-SG-2 and MGU-SG-3). None of the VOCs was detected above the SL value.

It should be noted that a set of duplicate samples for soil vapor (MGU-SV-2 and MGU-SV-3) and soil gas (MGU-SG-1 and MGU-SG-2) were taken during the investigation. Some deviations appeared in the analytical results between the duplicate samples, primarily a difference in which compounds were detected in each sample. However, results for the same compound detected in the duplicate samples were similar.

#### 4.0 CONCLUSION AND RECOMMENDATIONS

Based on analytical results and the risk assessment conducted for the subject property, it appears that vapor intrusion from VOCs may be occurring. Of the compounds detected below the slab, only methylene chloride, acetone, and ethanol were detected in the ambient air. Although levels of acetone and ethanol may be contributed to the laboratory that analyzed the samples, as they are common laboratory contaminants, there is also potential for these VOCs to be entering the structure.

The analytical results indicate a wide variety of potential contaminants. However, the contaminants detected in excess of the RSLs and SLs are not consistent with the former site use as a manufactured gas plant (MGP). In particular, tetrachloroethene (the highest-detected concentration of any compounds found in the samples collected) is typically a dry cleaner contaminant. While some potential MGP contaminants like benzene and toluene were detected, gasoline contaminants were also detected in the results, which would indicate that the benzene and toluene could be attributed to the MGP site or a gasoline release. Freon in multiple forms was detected throughout the site, the source of which is difficult to determine. Vapor intrusion is a potential cause of concern at the site, based on the indoor air and air monitoring readings. The array of contaminants detected makes it difficult to determine the source.

Based on the results, Tetra Tech recommends that a risk assessment be performed on the results to determine whether vapor mitigation is necessary in the structure. Based on the screening levels, a vapor mitigation system (such as a slab depressurization system) and repairs to remove cracks in the walls and floor may be necessary.

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## **TABLES**

- 1 – SAMPLE SUMMARY
- 2 – AIR MONITORING SUMMARY
- 3 – SUMMARY OF VOCS DETECTED IN SOIL GAS AND  
AMBIENT AIR SAMPLES

TABLE 1 - SAMPLE SUMMARY

Sample ID	Location	Matrix	Canister No.	Regulator No.	Start Date	Start Time	End Date	End Time	Start Vacuum (in. Hg)	End Vacuum (in. Hg)	Start Temp		End Temp		Comments
											Inside (°F)	Outside (°F)	Inside (°F)	Outside (°F)	
MGU-IA-1	Indoor	AA	0280	2864	5/15/2014	10:24	5/16/2014	09:07	-28.5	0	66	48	57	39	
MGU-IA-2	Indoor	AA	0274	2975	5/15/2014	10:18	5/16/2014	09:04	-28	0	66	48	57	39	
MGU-OA-1	Outdoor	AA	0207	2889	5/15/2014	10:34	5/16/2014	08:51	-28	-2	N/A	48	N/A	39	
MGU-SV-1	Indoor	SV	0675	2983	5/15/2014	10:18	5/16/2014	09:04	-27	-1	66	48	57	39	
MGU-SV-2	Indoor	SV	0488	2841	5/15/2014	10:20	5/16/2014	09:09	-29	-0.5	66	48	57	39	Duplicate SV-3
MGU-SV-3	Indoor	SV	4626	2999	5/15/2014	10:21	5/16/2014	09:10	-31	-11.5	66	48	57	39	Duplicate SV-2
MGU-SV-4	Indoor	SV	0241	2968	5/15/2014	10:22	5/16/2014	09:50	-31	-22	66	48	57	39	
MGU-SV-5	Indoor	SV	0666	2960	5/15/2014	10:25	5/16/2014	09:07	-27.5	-1	66	48	57	39	
MGU-SG-1	Outdoor	SG	Tedlar Bags		5/16/2014	13:18	---	---	---	---	---	39	---	39	Duplicate SG-2, Sample Depth 4' bgs
MGU-SG-2	Outdoor	SG	Tedlar Bags		5/16/2014	13:21	---	---	---	---	---	39	---	39	Duplicate SG-1, Sample Depth 4' bgs
MGU-SG-3	Outdoor	SG	Tedlar Bags		5/16/2014	13:45	---	---	---	---	---	39	---	39	Sample Depth 4' bgs

## NOTES:

AA Ambient Air  
SG Soil Gas  
SV Soil Vapor

TABLE 2 - AIR MONITORING SUMMARY -MAY 14, 2014

Time	Location	MultiRAE Pro					UltraRAE 3000	Comments - Locations Depicted on Figures 3 and 4
		OXY (%)	CO (ppm)	VOC (ppb)	LEL (%)	H2S (ppm)	Benzene (ppb)	
16:08	Bottom of stairs	20.9	0	140	0	0	0	Bottom of Stairs
16:09	Bathroom	20.9	0	140	0	0	0	Basement Bathroom
16:13	Basement	20.9	0	160	0	0	0	Wine Cellar
16:15	Basement	20.9	0	90	0	0	0	Pipe Room
16:18	Basement	20.9	0	30	0	0	0	Utilities Room
16:20	Basement	20.9	0	10	0	0	0	Workshop - NE Corner
16:22	Basement	20.9	0	20	0	0	0	Workshop - SE Corner
16:24	Basement	20.9	0	10	0	0	0	Workshop - SW Corner
16:26	Basement	20.9	0	0	0	0	0	Living Room - SE Corner
16:28	Basement	20.9	0	0	0	0	0	Canning Room - SW Corner
18:00	Basement	20.9	0	280	0	0	---	Pipe Room - Inside Drilled Sample Borehole
18:15	Basement	20.9	0	0	0	0	---	Wine cellar - Inside Borehole
18:30	Basement	20.9	0	60	0	0	---	Canning Room - Inside Borehole
18:42	Basement	20.5	0	0	0	0	---	Living Room - SE Corner - Inside Borehole

NOTES:

- OXY      Oxygen
- CO        Carbon Monoxide
- VOC      Volatile Organic Compounds
- LEL      Lower Explosive Limit
- H2S      Hydrogen Disulfide

TABLE 3 – SUMMARY OF VOCs DETECTED IN SOIL GAS AND AMBIENT AIR SAMPLES

Sample Number :			US EPA Regional Screening Level (RSL) Residential Air Supporting Table (TR=1E-6, HQ=0.1) May 2014 (µg/m3)				US EPA Regional Screening Level (RSL) Industrial Air Supporting Table (TR=1E-6, HQ=0.1) May 2014 (µg/m3)				MGU-IA-1	MGU-IA-2	MGU-OA-1	MGU-SG-1	MGU-SG-2	MGU-SG-3	MGU-SV-1	MGU-SV-2	MGU-SV-3	MGU-SV-4	MGU-SV-5	
Resident Address:			Soil Gas				Ind. Air				indoor ambient air ug/m3	indoor ambient air ug/m3	indoor/ambient air ug/m3	soil gas ug/m3	soil gas ug/m3	soil gas ug/m3	soil gas ug/m3	soil gas ug/m3	soil gas ug/m3	soil gas ug/m3	soil gas ug/m3	soil gas ug/m3
Matrix :			Soil Gas				Ind. Air				Spectrum Analytical, Inc.											
Units :			Soil Gas				Ind. Air				5/16/2014	5/16/2014	5/16/2014	5/15/2014	5/15/2014	5/16/2014	5/16/2014	5/16/2014	5/16/2014	5/16/2014	5/16/2014	5/16/2014
Laboratory			Soil Gas				Ind. Air				9:07	9:04	8:51	13:18	13:22	13:45	9:04	9:09	9:10	9:50	9:07	
Case #:			Soil Gas				Ind. Air				5	5										
SDG:			Soil Gas				Ind. Air															
Sample Date:			Soil Gas				Ind. Air															
Sample Time:			Soil Gas				Ind. Air															
Dilution:			Soil Gas				Ind. Air															
Duplicate:			Soil Gas				Ind. Air															
Compound	CAS #	Key	Soil Gas	Res. Air	Soil Gas	Ind. Air																
Propene	115-07-1	n	3100	310	13000	1300																
Dichlorodifluoromethane (Freon12)	75-71-8	n	100	10	440	44																
Chloromethane	74-87-3	n	94	9.4	390	39																
1,2-Dichlorotetrafluoroethane (Freon 114)	76-14-2																					
Vinyl chloride	75-01-4	c	1.7	0.17	28	2.8																
1,3-Butadiene	106-99-0	c	0.94	0.094	4.1	0.41																
Bromomethane	74-83-9	n	5.2	0.52	22	2.2																
Chloroethane	75-00-3		10000	1000	44000	4400																
Acetone	67-64-1	n	32000	3200	140000	14000																
Trichlorofluoromethane (Freon 11)	75-69-4	n	730	73	3100	310																
Ethanol	64-17-5																					
Acrylonitrile	107-13-1	c	0.41	0.041	1.8	0.18																
1,1-Dichloroethene	75-35-4	n	210	21	880	88																
Methylene chloride	75-09-2	n	630	63	2600	260																
1,1,2-Trichlorotrifluoroethane (Freon 113)	76-13-1	n	31000	3100	130000	13000																
Carbon disulfide	75-15-0	n	730	73	3100	310																
trans-1,2-Dichloroethene	156-60-5	n	63	6.3	260	26																
1,1-Dichloroethane	75-34-3	c	18	1.8	77	7.7																
Methyl tert-butyl ether	1634-04-4	c	110	11	470	47																
Isopropyl alcohol	67-63-0	n	7300	730	31000	3100																
2-Butanone (MEK)	78-93-3	n	5200	520	22000	2200																
cis-1,2-Dichloroethene	156-59-2																					
Hexane	110-54-3	n	730	73	3100	310																
Ethyl acetate	141-78-6	n	73	7.3	310	31																
Chloroform	67-66-3	c	1.2	0.12	5.3	0.53																
Tetrahydrofuran	109-99-9	n	2100	210	8800	880																
1,2-Dichloroethane	107-06-2	c	1.1	0.11	4.7	0.47																
1,1,1-Trichloroethane	71-55-6	n	5200	520	22000	2200																
Benzene	71-43-2	c	3.6	0.36	16	1.6																
Carbon tetrachloride	56-23-5	c	4.7	0.47	20	2																
Cyclohexane	110-82-7	n	6300	630	26000	2600																
1,2-Dichloropropane	78-87-5	c	2.8	0.28	12	1.2																
Bromodichloromethane	75-27-4	c	0.76	0.076	3.3	0.33																
Trichloroethene	79-01-6	n	2.1	0.21	8.8	0.88																
1,4-Dioxane	123-91-1	c	5.6	0.56	25	2.5																
n-Heptane	142-82-5																					
4-Methyl-2-pentanone (MIBK)	108-10-1	n	3100	310	13000	1300																
cis-1,3-Dichloropropene	10061-01-5	c	7	0.7	31	3.1																
trans-1,3-Dichloropropene	10061-02-6	c	7	0.7	31	3.1																
1,1,2-Trichloroethane	79-00-5	n	0.21	0.021	0.88	0.088																
Toluene	108-88-3	n	5200	520	22000	2200																
2-Hexanone (MBK)	591-78-6	n	31	3.1	130	13																
Dibromochloromethane	124-48-1	c	1	0.1	4.5	0.45																
1,2-Dibromoethane (EDB)	106-93-4	c	0.047	0.0047	0.2	0.02																
Tetrachloroethene	127-18-4	n	42	4.2	180	18																
Chlorobenzene	108-90-7	n	52	5.2	220	22																
1,1,1,2-Tetrachloroethane	630-20-6	c	3.8	0.38	17	1.7																
Ethylbenzene	100-41-4	c	11	1.1	49	4.9																
m,p-Xylene	179601-23-1	n	100	10	440	44																
Bromoform	75-25-2	c	26	2.6	110	11																
Styrene	100-42-5	n	1000	100	4400	440																
o-Xylene	95-47-6	n	100	10	440	44																
1,1,2,2-Tetrachloroethane	79-34-5	c	4.8	0.48	18	1.8																
Isopropylbenzene	98-82-8	n	420	42	1800	180																
1,3,5-Trimethylbenzene	108-67-8																					
4-Ethyltoluene	622-96-8																					
1,2,4-Trimethylbenzene	95-63-6	n	7.3	0.73	31	3.1																
Naphthalene	91-20-3	c	0.83	0.083	3.6	0.36																
1,3-Dichlorobenzene	541-73-1																					
Benzyl chloride	100-44-7	c	0.57	0.057	2.5	0.25																
1,4-Dichlorobenzene	106-46-7	c	2.6	0.26	11	1.1																
sec-Butylbenzene	135-98-8																					
4-Isopropyltoluene	99-87-6																					
1,2-Dichlorobenzene	95-50-1	n	210	21	880	88																
n-Butylbenzene	104-51-8																					
1,2,4-Trichlorobenzene	120-82-1	n	2.1	0.21	8.8	0.88																
Hexachlorobutadiene	87-68-3	c	1.3	0.13	5.6	0.56																
Total VOCs																						
# of different VOCs detected in sample																						

Notes:  
c = carcinogen  
n = non-carcinogen  
TIC = tentitively identified compound  
D = diluted sample

Color indicates highest RSL exceeded for appropriate matrix

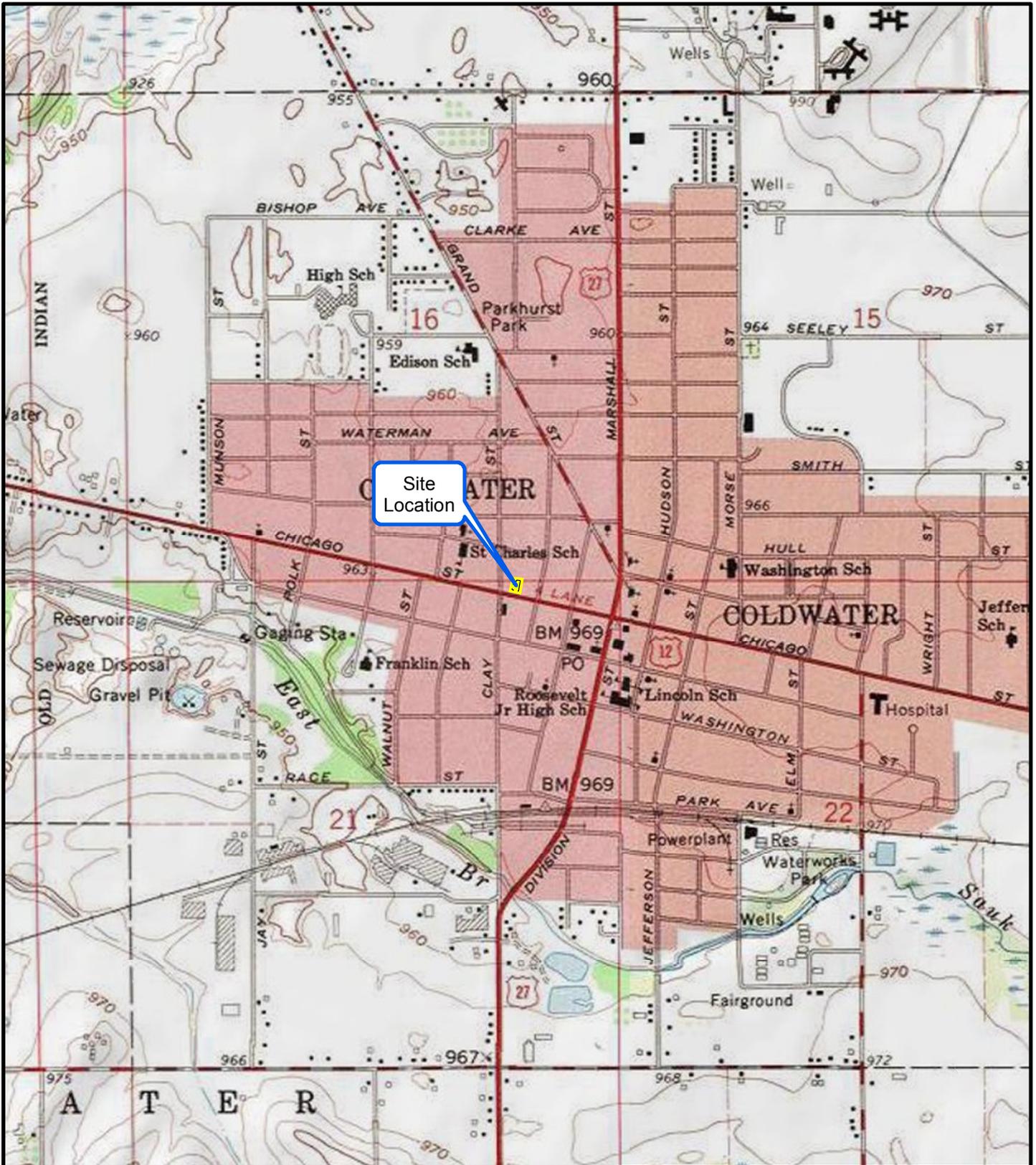
270	conc exceeds EPA screening level for resident soil gas (May 2014)
0.72	conc exceeds EPA RSL for resident air (May 2014)
270	conc exceeds EPA screening level for industrial soil gas (May 2014)
0.72	conc exceeds EPA RSL for industrial air (May 2014)

RSLs for carcinogens are calculated at 1E-06 risk and RSLs for non-carcinogens are adjusted to HI of 0.1  
The sub-slab soil gas screening values are 10 times higher than the indoor air and ambient air RSLs due to the attenuation factor of 0.1.

## **APPENDIX A**

### **FIGURES**

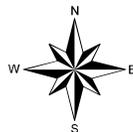
- 1 – SITE LOCATION MAP
- 2 – SITE LAYOUT MAP
- 3 – SAMPLING LOCATION MAP (INDOOR)
- 4 – SAMPLING LOCATION MAP (OUTDOOR)
- 5 – ANALYTICAL RESULTS MAP (INDOOR)
- 6 – ANALYTICAL RESULTS MAP (OUTDOOR)



Site Location

LEGEND

 Approximate Property Boundary



0 1,000 2,000

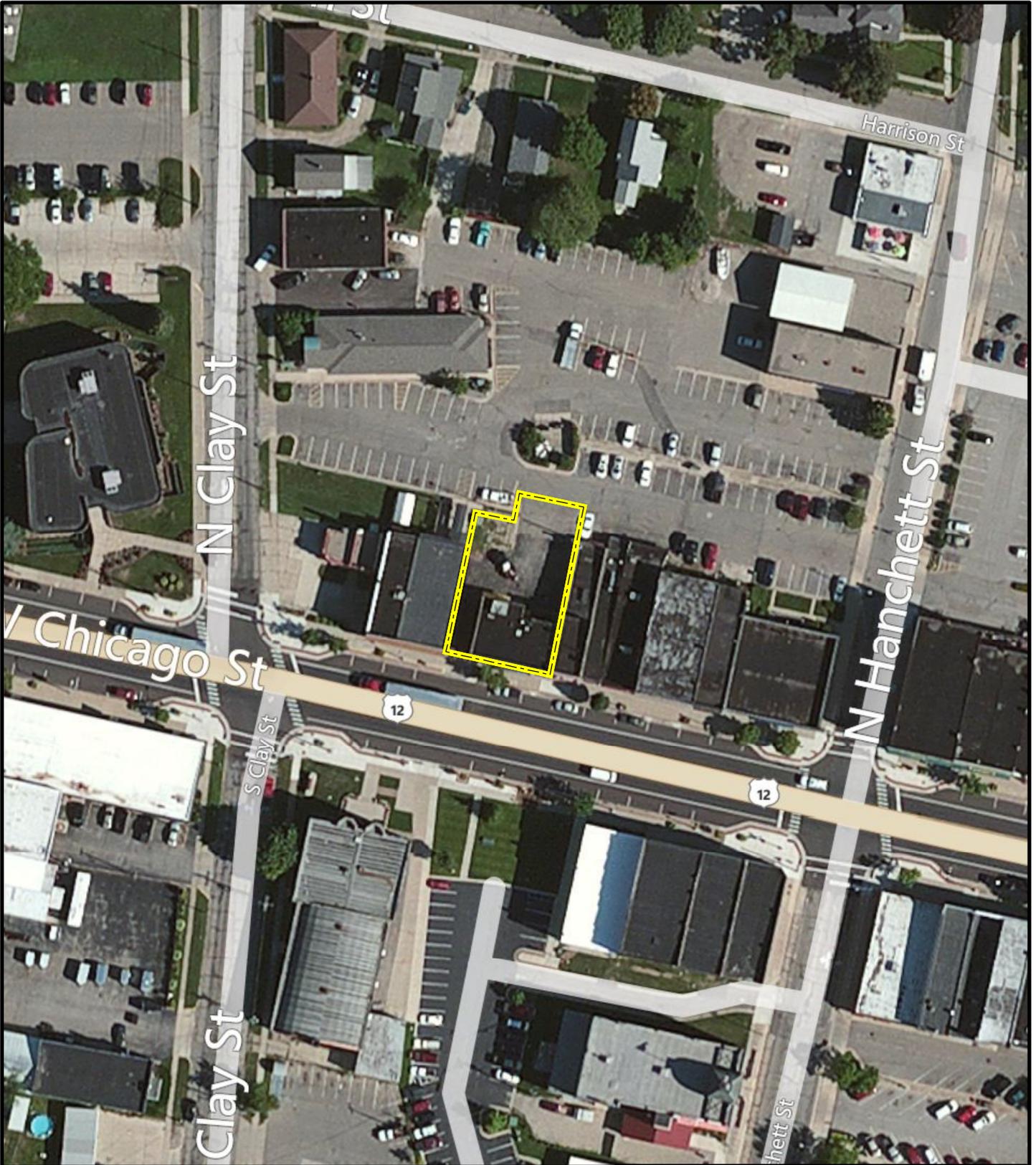
Feet

MICHIGAN GAS UTILITIES  
78 WEST CHICAGO STREET  
COLDWATER, BRANCH COUNTY, MICHIGAN

FIGURE 1  
SITE LOCATION MAP

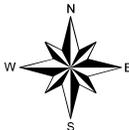


SOURCE: MODIFIED FROM USGS, COLDWATER WEST 7.5-MINUTE (1:24,000 SCALE) TOPOGRAPHIC MAP, 1979 (PHOTO REVISED FROM 1961).



LEGEND

 Approximate Property Boundary

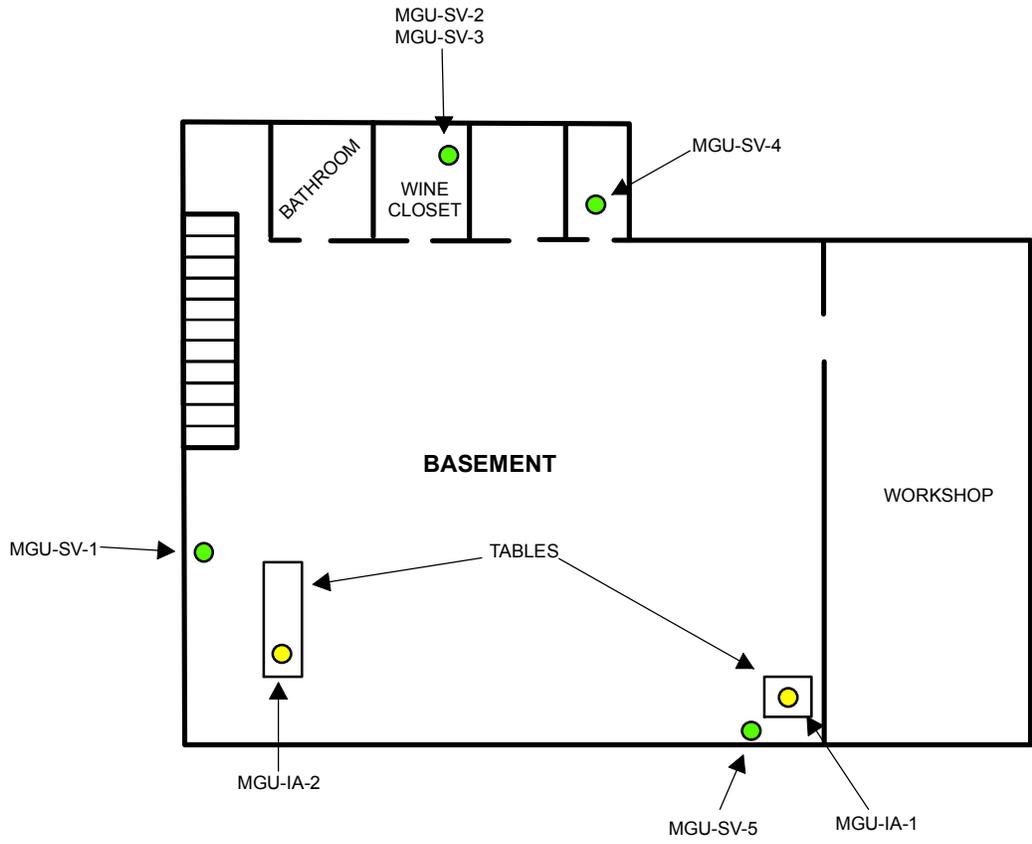


0 50 100  
 Feet

MICHIGAN GAS UTILITIES  
78 WEST CHICAGO STREET  
COLDWATER, BRANCH COUNTY, MICHIGAN

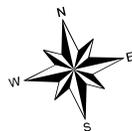
FIGURE 2  
SITE LAYOUT MAP





LEGEND

-  Ambient Air Sample
-  Soil Gas Sample



0 7.5 15  
Feet

NOTE: BUILDING/ROOM DIMENSIONS ARE APPROXIMATE.

MICHIGAN GAS UTILITIES  
78 WEST CHICAGO STREET  
COLDWATER, BRANCH COUNTY, MICHIGAN

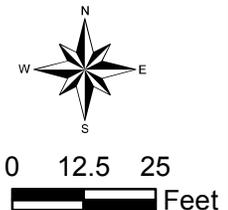
FIGURE 3  
SAMPLE LOCATION MAP (INDOOR)





LEGEND

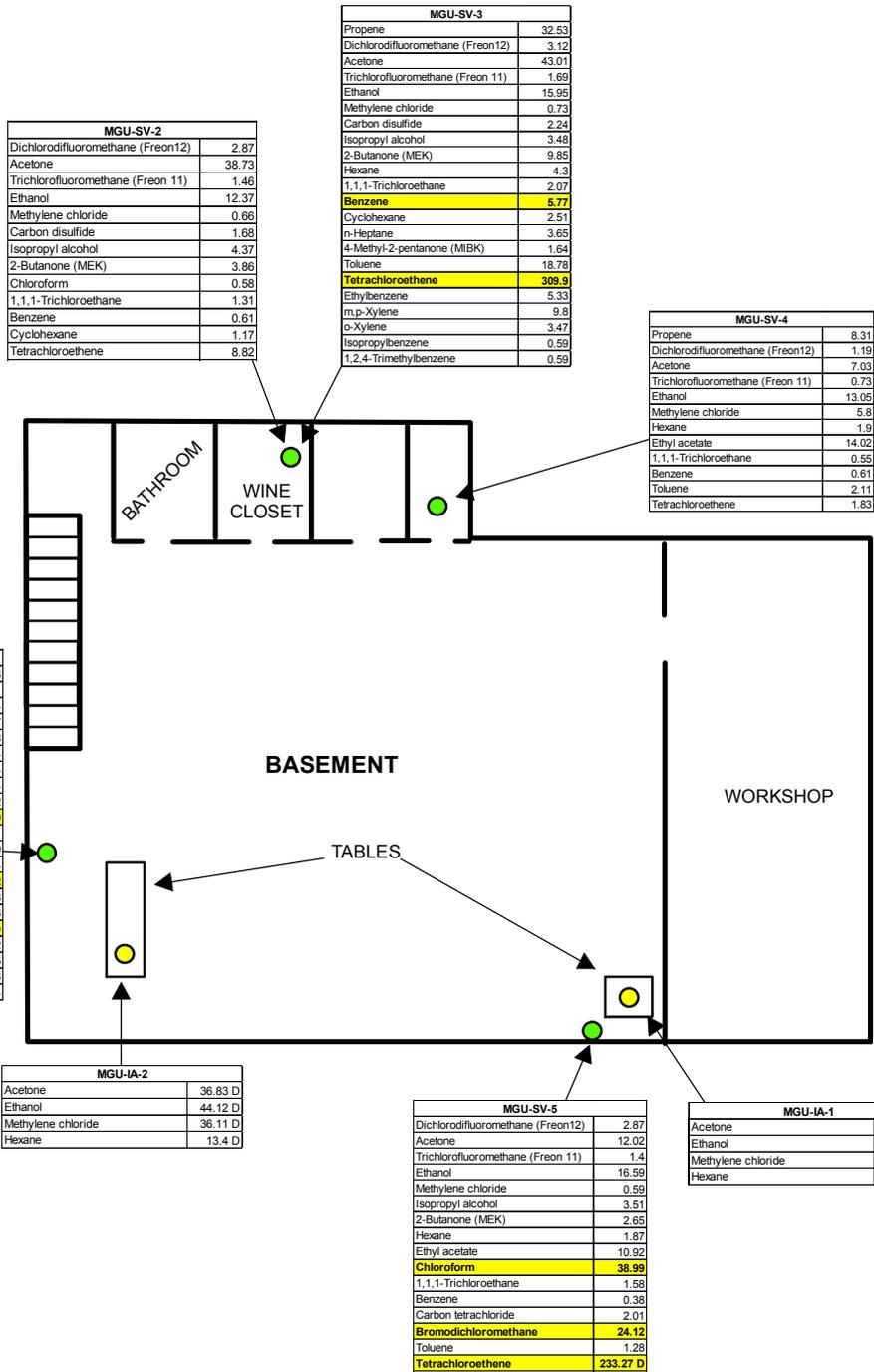
-  Approximate Property Boundary
-  Ambient Air Sample
-  Soil Gas Sample



MICHIGAN GAS UTILITIES  
78 WEST CHICAGO STREET  
COLDWATER, BRANCH COUNTY, MICHIGAN

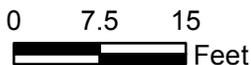
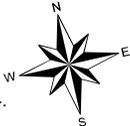
FIGURE 4  
SAMPLE LOCATION MAP (OUTDOOR)





**LEGEND**

- Ambient Air Sample
- Soil Gas Sample
- 160 Concentration exceeds EPA SL for resident soil gas (Source: EPA RSL Resident Air Supporting Table [TR=1E-06, HQ=0.1]) May 2014.
- D Diluted Sample

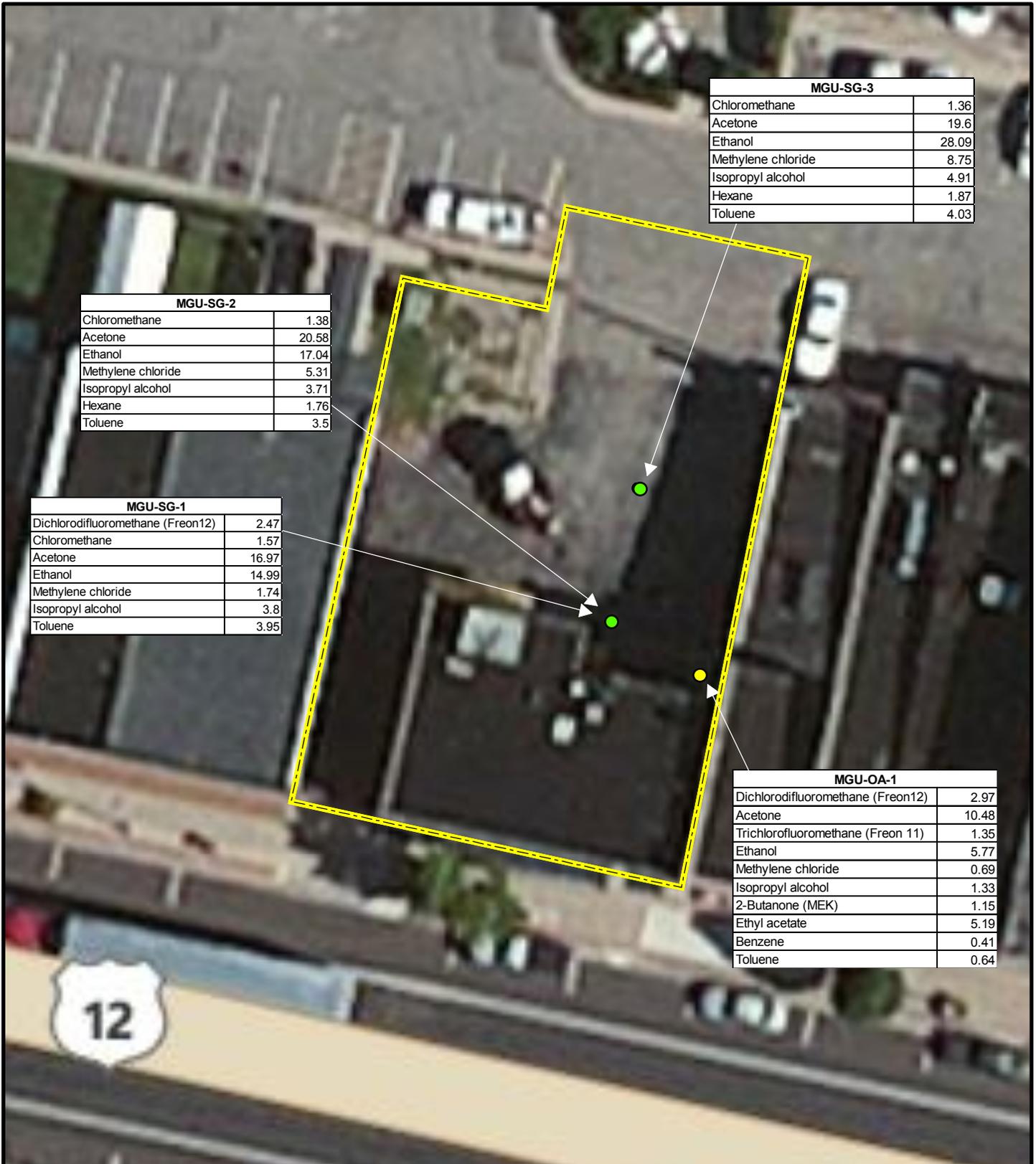


NOTE: BUILDING/ROOM DIMENSIONS ARE APPROXIMATE.  
ALL RESULTS ARE PRESENTED IN MICROGRAMS PER CUBIC METER.

MICHIGAN GAS UTILITIES  
78 WEST CHICAGO STREET  
COLDWATER, BRANCH COUNTY, MICHIGAN

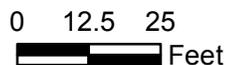
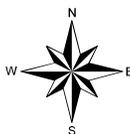
**FIGURE 5**  
**ANALYTICAL RESULTS MAP (INDOOR)**





**LEGEND**

-  Approximate Property Boundary
-  Ambient Air Sample
-  Soil Gas Sample



NOTE: ALL RESULTS ARE PRESENTED IN MICROGRAMS PER CUBIC METER.

SOURCE: MODIFIED FROM BING MAPS HYBRID, 2012.

MICHIGAN GAS UTILITIES  
78 WEST CHICAGO STREET  
COLDWATER, BRANCH COUNTY, MICHIGAN

**FIGURE 6**  
ANALYTICAL RESULTS MAP (OUTDOOR)



**APPENDIX B**  
**FIELD LOGBOOK NOTES**



*Rite in the Rain®*  
ALL-WEATHER  
**ENVIRONMENTAL  
FIELD BOOK**  
Nº 550

### ENTERING INFORMATION IN THE LOGBOOK

Enter the following information at the beginning of each day or whenever warranted during the course of a day:

- Date
- Starting time
- Specific location
- General weather conditions and approximate temperature
- Names of personnel present at the site. Note the affiliation(s) and designation(s) of all personnel
- Equipment calibration and equipment models used.
- Changes in instructions or activities at the site
- Levels of personal protective clothing and equipment
- A general title of the first task undertaken (for example, well installation at MW-11, decon at borehole BH-11, groundwater sampling at MW-11)
- Approximate scale for all diagrams. If this can't be done, write "not to scale" on the diagram.
- Indicate the north direction on all maps and cross-sections. Label features on each diagram.
- Corrections, if necessary, necessarily including a single line through the entry being corrected. Initial and date any corrections made in the logbook.
- After last entry on each page, initials of the person recording notes. No information is to be entered in the area following these initials.
- At the end of the day, signature of the person recording notes and date at the bottom of the last page. Indicate the end of the work day by writing "Left site at (time)." A diagonal line must be drawn across any remaining blank space at the bottom of this last page.

The following information should be recorded in the logbook after taking a photograph:

- Time, date, location, direction, and, if appropriate, weather conditions
- Description of the subject photographed and the reason for taking the picture
- Sequential number of the photograph and the film roll number or disposable camera used (if applicable)
- Name of the photographer.

The following information should be entered into the logbook when collecting samples:

- Location description
- Name(s) of sampler(s)
- Collection time
- Designation of sample as a grab or composite sample
- Type of sample (water, sediment, soil gas, etc.)
- On-site measurement data (pH, temperature, specific conductivity)
- Field observations (odors, colors, weather, etc.)
- Preliminary sample description
- Type of preservative used
- Instrument readings.

### START FIELD LOGBOOK

Logbook Tracking Number CH001

Site Name Michigan Gas Utilities - RS

Issue to Kevin Scott

Date Issued 5/13/14

TDD # 103X902600015051405006



Location Coldwater, MI Date 5/14/14  
 Project / Client Mich. GAS Util.

1500 E.T. Weather: RAINING  
 Temps in mid 50<sup>s</sup> (F°)

1530 K.S. + V.P. Arrive at  
 the Project address  
 78 W Chicago Street,  
 Coldwater MI.  
 K.S. + V.P. meet property  
 owners: Stephen +  
 ALEXIA RISH. MR.  
 RISH INVITES US INTO  
 HIS STORE (CLOSED TODAY  
 TO ALLOW US TO PERFORM  
 OUR WORK UNIMPDED)  
 AND PROVIDES BACKGROUND  
 + HISTORY ABOUT SITE  
 MR. RISH PROVIDED Tt  
 personnel with HARD COPY  
 OF Remedial INVESTIGATION  
 REPORT prepared for the  
 former manufactured GAS  
 Plant (MGP) site by  
 Pescador, LLC (in TRAVERSE  
 CITY, MI).  
 K Scott

Location Coldwater, MI Date 5/14/14  
 Project / Client MI GAS UTIL.

1600 MR. RISH Leads Tt  
 personnel to basement where  
 sampling ~~was~~<sup>is</sup> to be performed  
 and points out specific  
 locations where he has  
 detected odors or noticed  
 staining on the foundation  
 walls. Tt were tentatively  
 identify locations to place  
 sub-slab sample ports,  
 during this tour of the  
 basement. Tt personnel  
 staged tools + equipment  
 in the basement where  
 work would be performed.

1605 Tt personnel conducted  
 air monitoring in basement  
 using MultiRAE Pro  
 + Ultra RAE 3000 w/  
 Benzene SEP tube.  
 Air monitoring parameters  
 consisted of: O<sub>2</sub>, CO, VOCs,  
 LEL, + H<sub>2</sub>S w/ the MultiRAE  
 Pro and Benzene, with

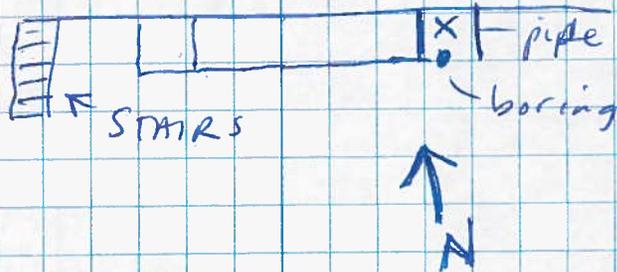
the UltraRAE 3000. Air monitoring results were recorded on a Tt generated Indoor Air Quality DATA SHEET. No readings were outside of normal / typical concentrations. The highest VOC concentration detected was 280 ppb with the MultiRAE Pro. Both instruments were calibrated prior to use. ~~66~~

1630

Air monitor sweep of basement complete. Tt prepared to drill borings for sub-slab sample ports. Drill rented by Tt from Field Environ.

Did NOT accommodate DRILL BITS needed to drill through concrete slabs so Tt procured hammer drill at Home Depot to complete the work  
~~CS. H~~

1800 Tt personnel completed first boring in pipe room were large diameter pipe entered the house from the north side of the house. The concrete in this room was in poor condition + missing in patches of the floor. A stainless steel sample port was inserted into the bore hole along with modeling clay to serve as packing to seal the annulus around the stainless steel tube. The top of the sample was inserted so that it was flush with the floor. Cement to be added later



Location Coldwater MI Date 5/14/14  
 Project / Client MICH. GAS. UTIL.

LATE ENTRY: PRIOR TO INSERTING the sample port into the bore hole, TE screened the headspace above the boring to detect any VOCs that may have been trapped. ~~NO~~ KS VOCs were detected at a conc. of 280 ppb at this hole. KS

1815 TE moved to next location in basement to install sample port. second port also along north wall - in wine cellar. Floor of wine cellar scanned w/ magnetomer / cable locator to ensure drilling would not encounter any utilities under concrete slab.

It also used extension cord w/ GFI when drilling. INSTALLATION OF remaining PORTS followed same procedure as above.

Location \_\_\_\_\_ Date \_\_\_\_\_

Project / Client \_\_\_\_\_

TE personnel used shop vac while drilling occurred to minimize dust from drilling ops. No VOCs were detected in hole drilled in wine closet. KS

1830 Third hole completed and port installed along west wall of basement. VOCs were detected at 60 ppb at head space of this hole w/ KlutterAE Pro.

1840 TE completes fourth hole + installs sample port in south east section of basement along south wall.

1845 Concrete slurry (concrete) was poured around the Annuluses of each sample port and will be allowed to harden

10

Location

Coldwater MI Date 5/14/14

Project / Client

MICH. GAS UTIL.

- over night before  
Leak test is performed.
- 1850 TE organized equipment  
+ supplies and was  
granted permission by  
property owner to leave  
tools + equipment  
in basement overnight.
- 1900 TE personnel depart  
site + head to hotel  
(Best Western) in Coldwater  
MI.
- E.O.S. ————— KS

~~5/14/14~~

Location

Coldwater, MI Date 5/15/14 11

Project / Client

MICH. GAS UTIL

- 0700 Kevin Scott (KS) + VADIM  
PETROV (VP) of Tetra Tech  
(TT) meet in Hotel lobby  
+ Depart for local Home Depot  
to pick up some add'l supplies  
(chain + lock to secure outdoor  
Summa canister + some poly  
tubing needed to perform  
Leak test of sampling port  
Weather: RAINING, 46°F
- 0730 KS + VP arrive at site  
+ prep summa canisters  
Property owner to meet TE  
personnel @ 0800 hrs
- 0800 Mr. + Mrs RISH on scene.  
KS + V.P enter building  
with summa canisters  
+ add'l sampling supplies  
TE personnel connect air  
flow restrictors to corresponding  
summa canister (CAN IDs +  
flow restrictor IDs provided  
by lab on already recorded  
on lab chain-of- custody, record.

12

Location

Coldwater, MT

Date

5/15/14

Project / Client

MICH. GAS UTIL. / EPA

0900 K.S. Assembles leak tester to perform helium leak test on sample port installed inside wine closet (sample ID: MGU-SV-2 + MGU-SV-3 (Duplicate Pair))

Late Entry.

0835 Jeff Lippert (EPA OSC) on scene. KS briefs OSC + resident on progress + planned activities. OSC continues discussion w/ resident/property owner.

1000 Tt personnel conduct leak test on sample port in wine closet. Helium conc of 49.7% in testing chamber sample drawn from port into Tedlar bag using 6L Air low flow air sampling pump + 1-L vacuum chamber. Sample in Tedlar bag tested for Helium using MGD-

Location

Coldwater, MT

Date

5/15/14

13

Project / Client

MICH. GAS UTIL. / EPA

2002 Helium Detector. 0.00 ppm measured inside Tedlar bag confirming sample port does not leak.

1015 Tt personnel connected SUMMA canisters to 4 sampling ports + completed complete Air Sampling DATA sheet for each location. Sample DATA sheet included initial canister + flow restrictor ID:, DATE, Time, Temp, + starting VAC in "Hg.

10:18 TETRA Tech personnel open first SUMMA can valve: SV-1 + IA 2 (see DATA sheets for remaining sample info.)

1020 Duplicate sample collected from wine closet (MGU-SV-2 + MGU-SV-3) DATA sheet UPDATED w/sample time + VAC

- pressure (1" Hg) Note  
vac pressure gauge  
read -4 at START  
+ -31 when summa valve  
opened. \_\_\_\_\_ KS
- 1022 sample in pipe room  
initiated (MGU-SV-4)
- 1024 INDOOR ~~AM~~ (BASEMENT)  
AMBIENT AIR SAMPLE  
in south east corner  
initiated (MGU-IA-1)  
DATA SHEET UPDATED w/  
pertinent info. regarding  
START TIME, VAC PRESSURE  
etc. \_\_\_\_\_ KS
- 1025 SUB SLAB SOIL VAPOR SAMPLE  
in south east corner  
of basement initiated.  
DATA SHEET UPDATED.
- 1034 Tetra Tech personnel  
place 1 summa  
CANISTER (G-L) outside  
to collect outdoor ambient  
mr for comparison.

- OUTDOOR AMBIENT AIR  
SAMPLE PLACED IN  
BACK YARD NEAR  
North east END OF  
BUILDING. SUMMA  
PLACED ON BIRD FEEDER  
ABOUT 2-3' off ground  
and secured to pipe  
using chain + combo  
lock. \_\_\_\_\_ KS
- 1034 OUTDOOR AMBIENT  
AIR SAMPLE (MGU-OA-1)  
initiated. DATA SHEET  
UPDATED. \_\_\_\_\_ KS
- 1035 MISS DIG UTILITY REFS  
ONSITE (WATER/SANITARY)  
to MARK OUT UTILITIES.  
KS + VP load vehicle  
with tools + equipment  
no longer needed  
for VI sampling in  
basement. \_\_\_\_\_ KS
- 1100 KS OSC discuss  
locations for soil gas  
\_\_\_\_\_ KS

16

Location

COLDWATER MI Date 5/15/14

Project / Client

MICH GAS UTIL / EPA

1130

KS + OSC talk w/  
property owner about  
historic sample results  
+ reports.

1145

KS + VP depart for  
lunch to allow for  
util mark outs to  
be completed.

1300

KS + V.P. initiate soil  
gas boring for first  
outdoor soil gas sample location  
BACK YARD, NORTH SIDE  
APPROX center of structure

1318

Tt personnel collect  
first outdoor soil  
gas sample using into  
1-L Tedlar bag using  
low flow bil air pump  
+ vac. chamber. AMS  
soil gas probe installed  
to approx. 4' bgs

1321

2nd SG sample collected  
from same location  
(Duplicate PAIR)

Location

COLDWATER MI Date 5/15/14 17

Project / Client

MICH GAS UTIL / EPA

SAMPLE IDs for  
Duplicate PAIR of  
soil gas samples -  
MGU-SG-1 +  
MGU-SG-2

1345 Tt personnel collect  
~~1st~~ second third soil  
gas sample from  
second location in  
back yard approx  
40' due North  
of 1st location  
sample ID - MGU-SG-3.

1400

Tt personnel pickup  
equipment + depart  
site. - Return to hotel  
to package + ship  
tools + equipment  
back to Field ENV.  
+ Tedlar bag soil  
gas samples to LAB

1600

Log book updated  
EOS  
K Scott  
2151.1

18

Location

Coldwater MI Date 5/16/14

Project / Client

MICH. GAS UTIL / EPA

0830 Tetra Tech (TT) personnel Kevin Scott (KS) & Vadim Petrov (VP) arrive at site (78 W. Chicago St., Coldwater MI) Property owner's already inside building. Weather: Temperature:  $\approx 40^{\circ}\text{F}$   
B.P.  $\approx 30$  in Hg.

0900 KS + VP meet owner Steve Rish (SR) + enter building. KS + VP head to basement + inspect vacuum pressures on Summa canister samplers. TT personnel observe that two of the vacuum pressures have already reach equilibrium ( $0$  in Hg).

0851 LATE ENTRY TT personnel begin closing valves in Summa canisters + record stop time + ending vacuum pressure for each canister. (OUTDOOR SAMPLE FIRST)

Location

Coldwater MI Date 5/16/14 19

Project / Client

MI. GAS UTIL. / EPA

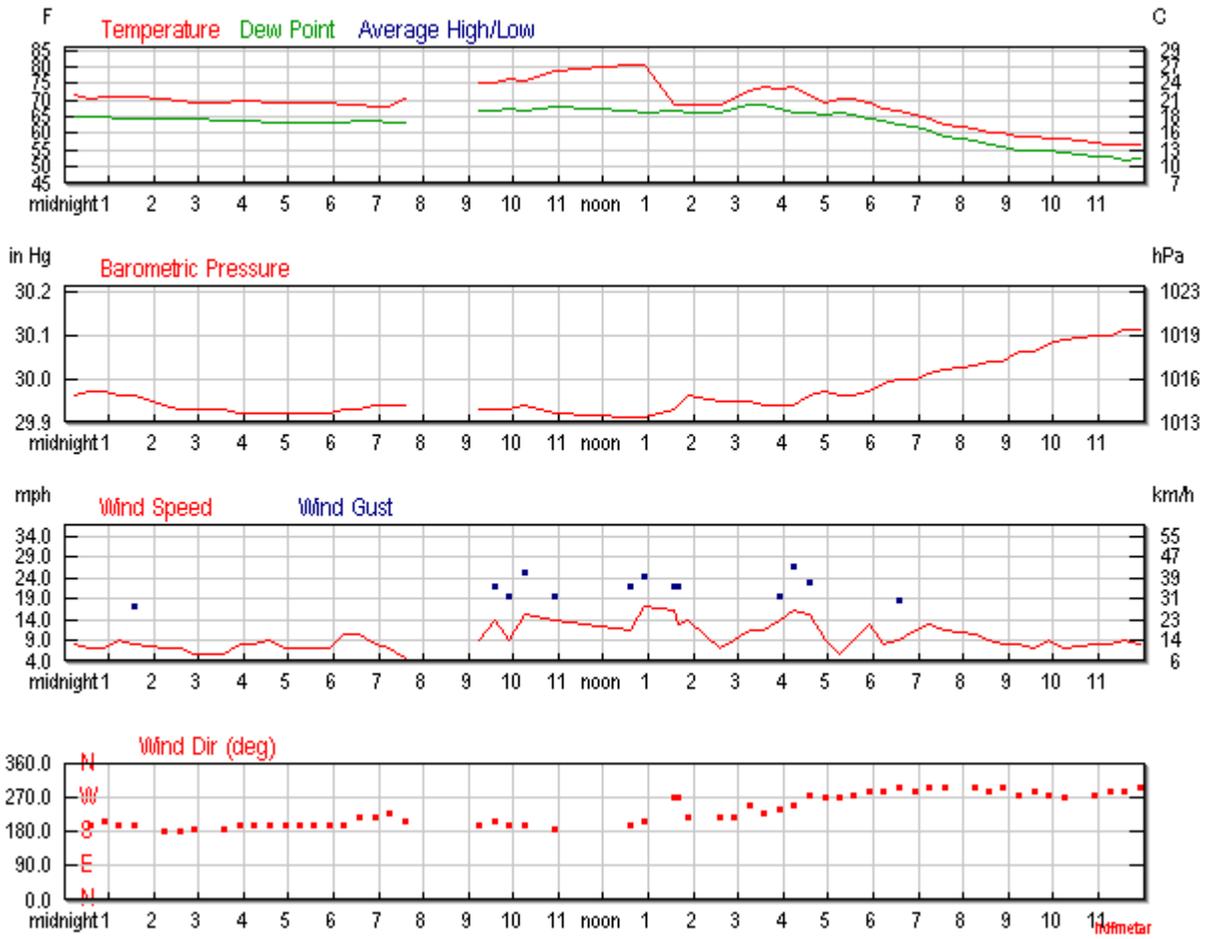
0904 TT personnel close valves on ~~KS~~ Summa canisters that already reach  $0$  in Hg first and were close to zero. TT personnel noted that one pressure gauge for sample (MGU-SV-4) - in pipe room had not moved significantly - potentially from blockage in sample port or improperly calibrated flow restrictor. TT personnel conducted other work + did not turn the valve off on this sampler to allow additional volume of soil gas sample to be collected. KS

KS + VP disconnected flow restrictors from Summas that had been turned off + placed cans + flow restrictors ~~in~~ in

**APPENDIX C**  
**WEATHER DATA**

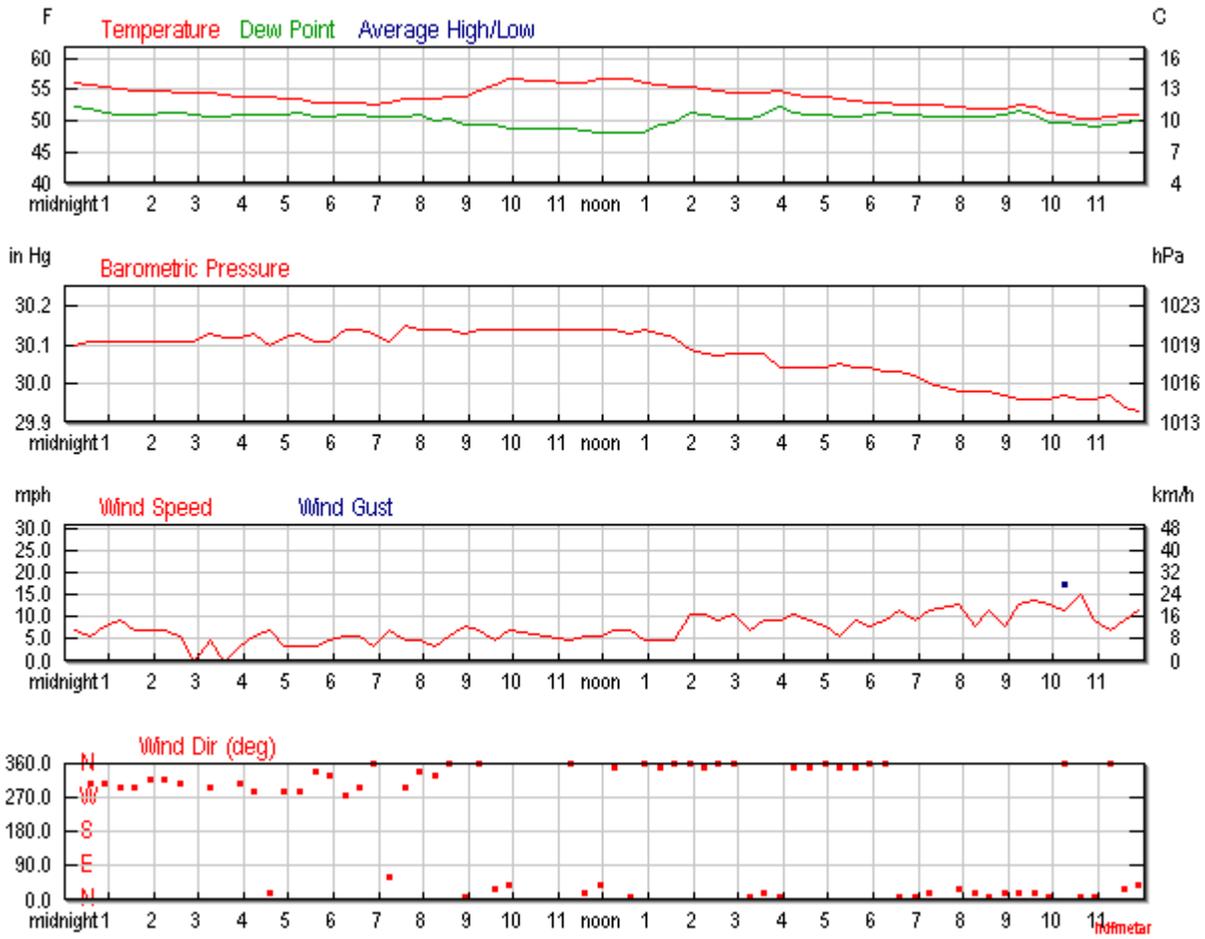
# Tuesday, May 13, 2014

## Daily Weather History Graph



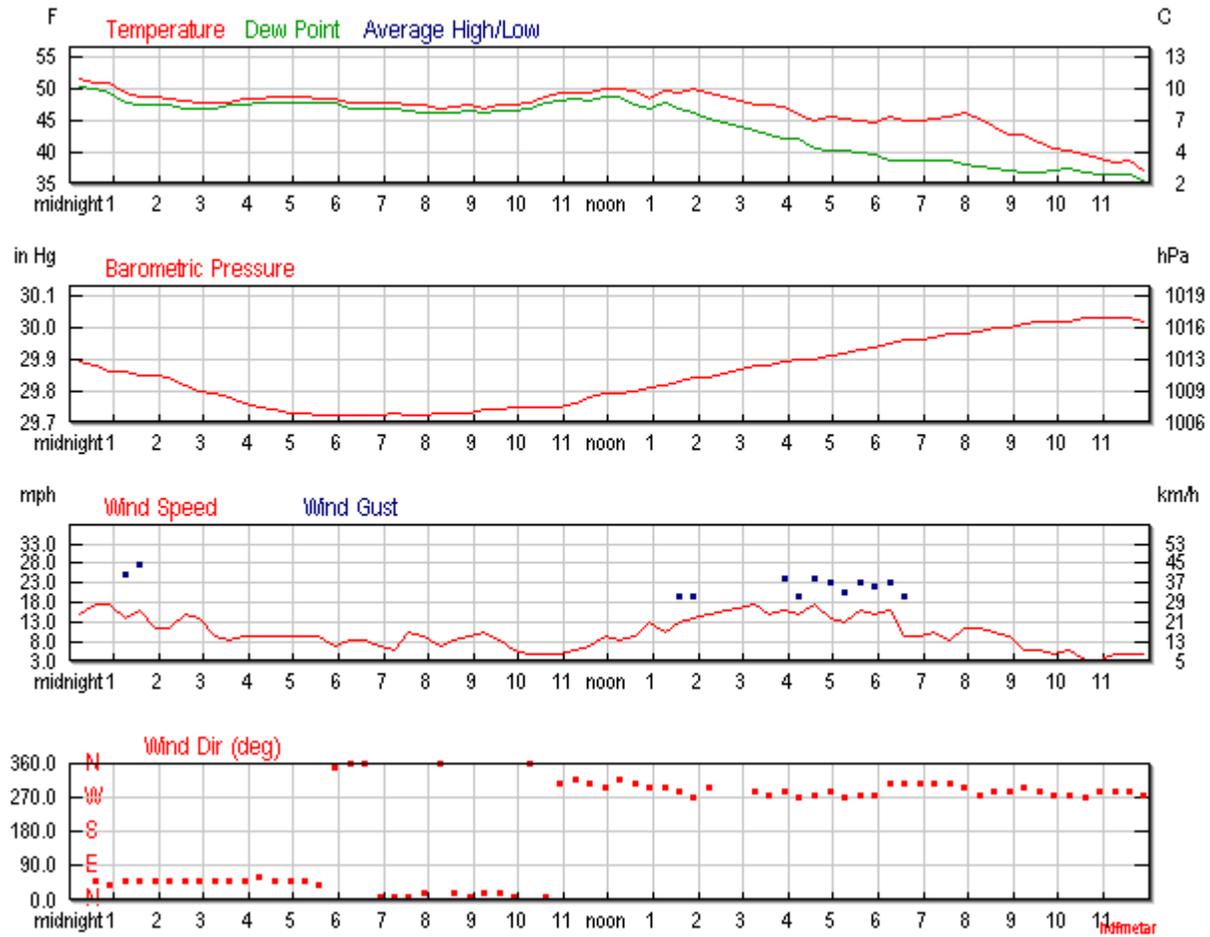
# Wednesday, May 14, 2014

## Daily Weather History Graph



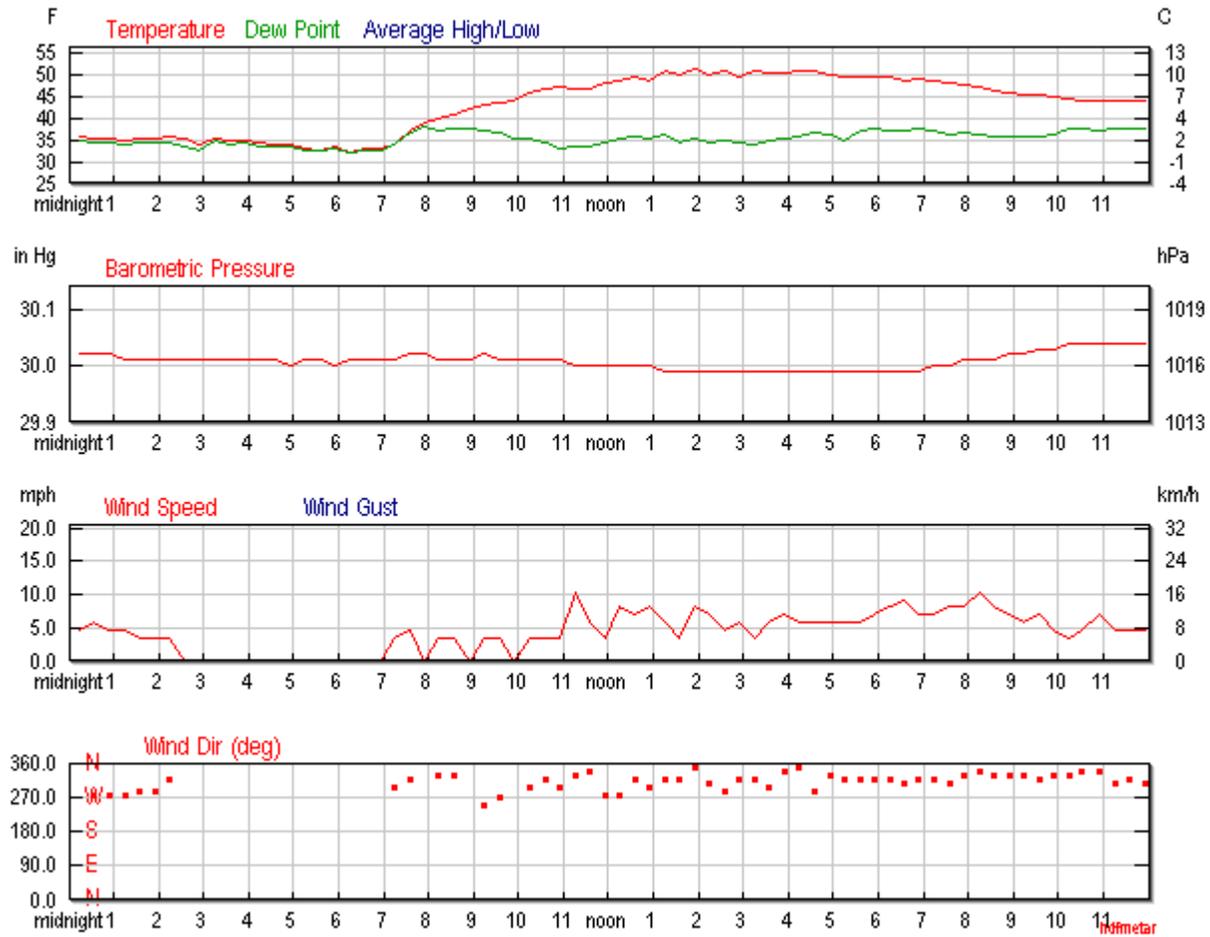
# Thursday, May 15, 2014

## Daily Weather History Graph



# Friday, May 16, 2014

## Daily Weather History Graph



**APPENDIX D**  
**FIELD DATA SHEETS**

MICH

Cassidy Creek Site - Clearview Landfill - Residential Indoor Air Quality Data Sheet

Name

Mr. Rish

Address

78 W. Chicago St., Coldwater, MI

Date

5/14/19

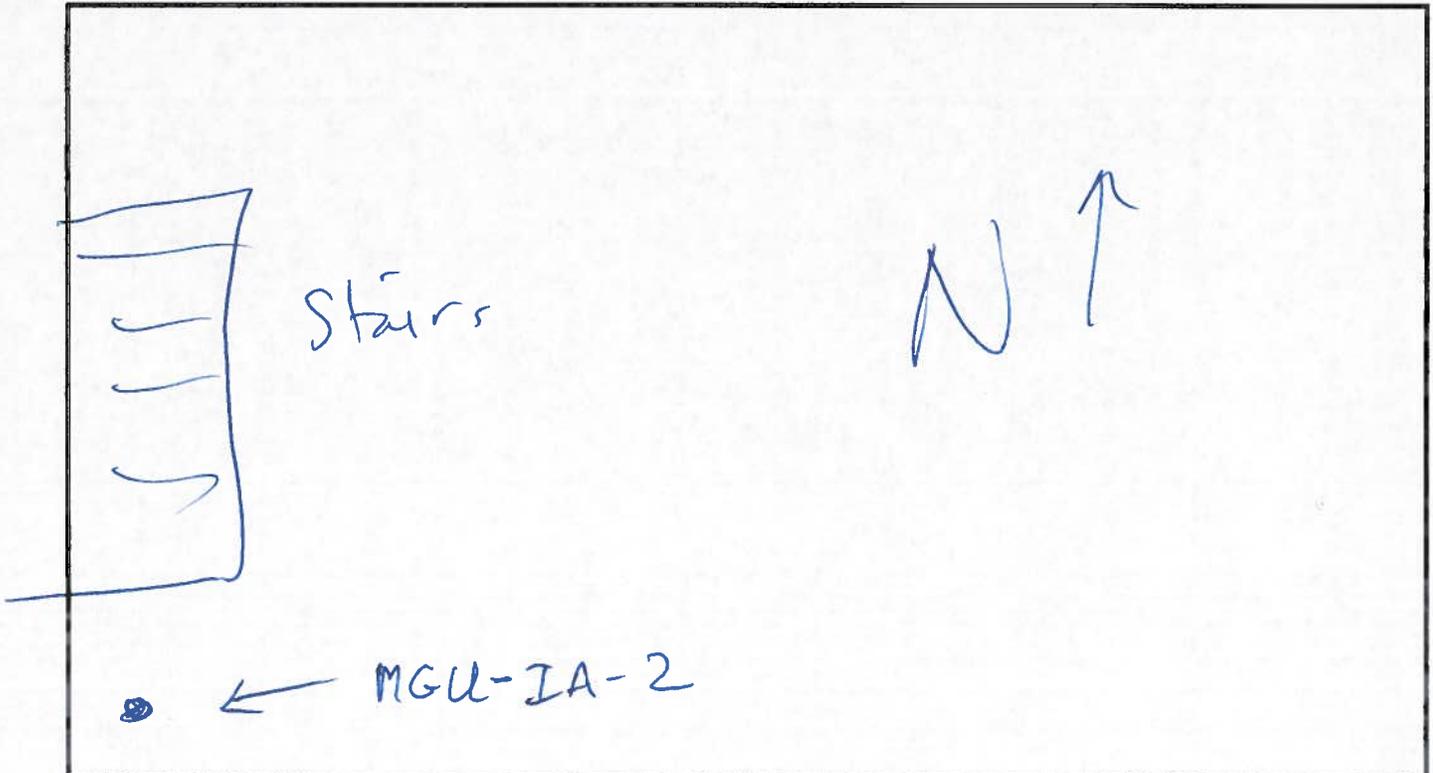
Time	Location/Level	MultiRAE Pro					UltraRAE 3000		Comments	
		OXY (%)	CO (ppm)	VOC (ppb)	LEL (%)	H2S (ppm)	Gamma (urem/h)	VOC (ppm)		Benzene (ppb)
16:08	Bottom bsmt stairs	20.9	φ	140	φ	φ	-	-	φ	bottom of stairs
16:09	bath room	20.9	φ	140	φ	φ	-	-	φ	basement bathroom
16:13	basement	20.9	φ	160	φ	φ	-	-	φ	wine cellar
16:15	basement	20.9	φ	90	φ	φ	-	-	φ	pipe room
16:18	basement	20.9	φ	30	φ	φ	-	-	φ	utilities room
16:20	basement	20.9	φ	10	φ	φ	-	-	φ	workshop - NE corner
16:22	basement	20.9	φ	20	φ	φ	-	-	φ	workshop - SE corner
16:24	basement	20.9	φ	10	φ	φ	-	-	φ	workshop - SW corner
16:26	basement	20.9	φ	φ	φ	φ	-	-	φ	living room - SE corner
16:28	basement	20.9	φ	φ	φ	φ	-	-	φ	canning room - SW corner
18:00	basement	20.9	φ	280	φ	φ	-	-	-	pipe room - inside drilled sample borehole
18:15	basement	20.9	φ	φ	φ	φ	-	-	-	wine cellar - inside borehole
18:30	basement	20.9	φ	60	φ	φ	-	-	-	canning room - bore hole
18:42	basement	20.5	φ	φ	φ	φ	-	-	-	living room SE corner - bore hole

## Air Sampling Data Sheet

Site Name: Mich GAS Util  
 Company: **Tetra Tech EMI**  
 Client: **U.S. EPA Region 5**  
 Resident Address: 78 W. Chicago St. Coldwater, MI

Location:	<input checked="" type="radio"/> Indoor <input type="radio"/> Outdoor	Matrix:	SV <input checked="" type="radio"/> AA
Sample ID No.:	<u>IA-2</u>	Floor/Level	_____
Canister ID No.:	<u>0274</u>	Regulator ID No.	<u>2975</u>
Start Date / Time	<u>5/15 10:18</u>	End Date / Time	<u>5/16 9:04</u>
Starting Vacuum (in Hg)	<u>-28</u>	End Vacuum	<u>0</u>
Temp - In (start)	<u>66</u>	Temp - In (stop)	<u>57</u>
Temp - Out (start)	<u>48</u>	Temp - Out (stop)	<u>39</u>
Baro. Press. - In (start)	_____	B.P. - In (stop)	_____
Baro. Press. - Out (start)	_____	B.P. - Out (stop)	_____
Sampler(s)	<u>Kovac Scott / Vadim Petrov</u>		

**Sketch**



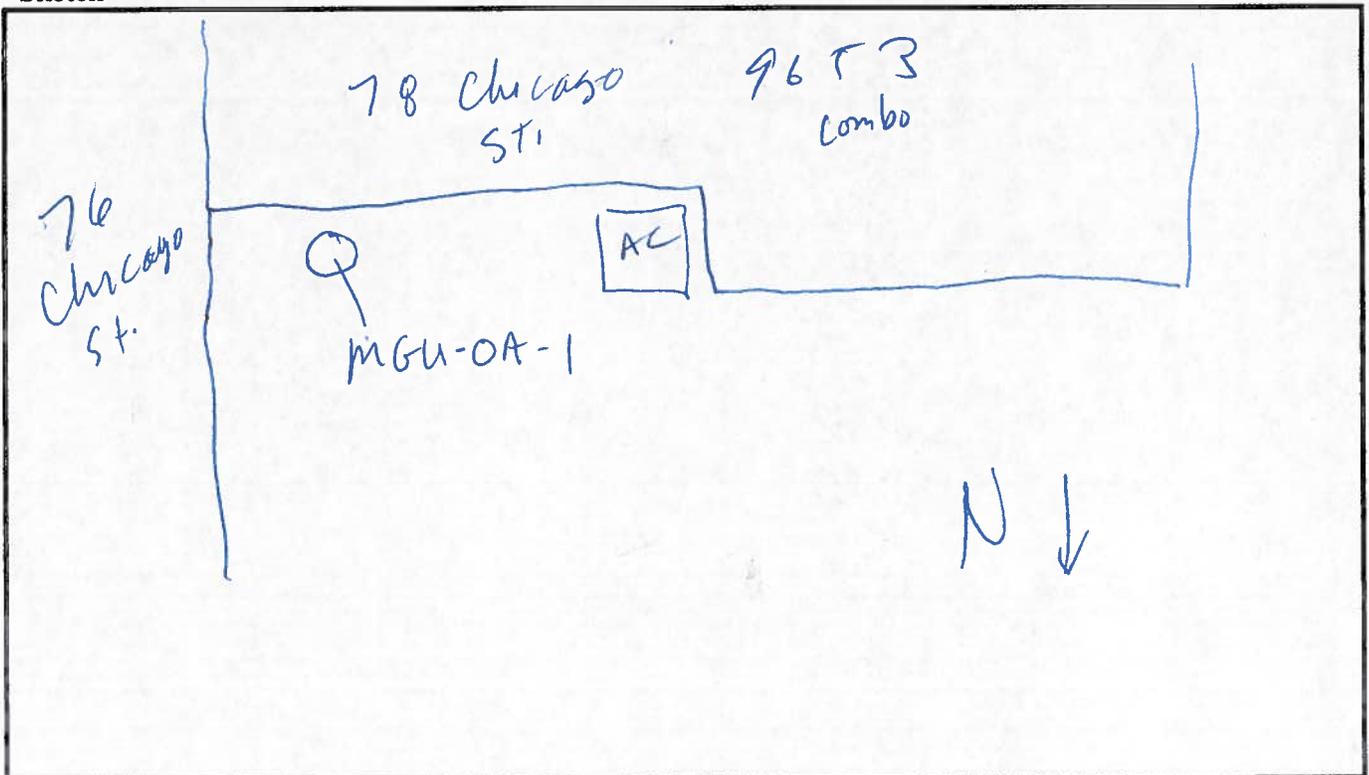
Comments:

## Air Sampling Data Sheet

Site Name: Mich GAS Util  
 Company: **Tetra Tech EMI**  
 Client: **U.S. EPA Region 5**  
 Resident Address: 78 W Chicago

Location:	Indoor <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">Outdoor</span>	Matrix:	SV <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">AA</span>
Sample ID No.:	<u>MGU-OA-1</u>	Floor/Level	_____
Canister ID No.:	<u>0207</u>	Regulator ID No.	<u>2889</u>
Start Date / Time	<u>5/15 10:34</u>	End Date / Time	<u>5/16/14 8:51</u>
Starting Vacuum (in Hg)	<u>-28</u>	End Vacuum	<u>-2</u>
Temp - In (start)	<u>NA</u>	Temp - In (stop)	<u>NA</u>
Temp - Out (start)	<u>48°</u>	Temp - Out (stop)	<u>39°</u>
Baro. Press. - In (start)	_____	B.P. - In (stop)	_____
Baro. Press. - Out (start)	_____	B.P. - Out (stop)	_____
Sampler(s)	<u>KEVIN SCOTT / VADIM Petrov</u>		

**Sketch**



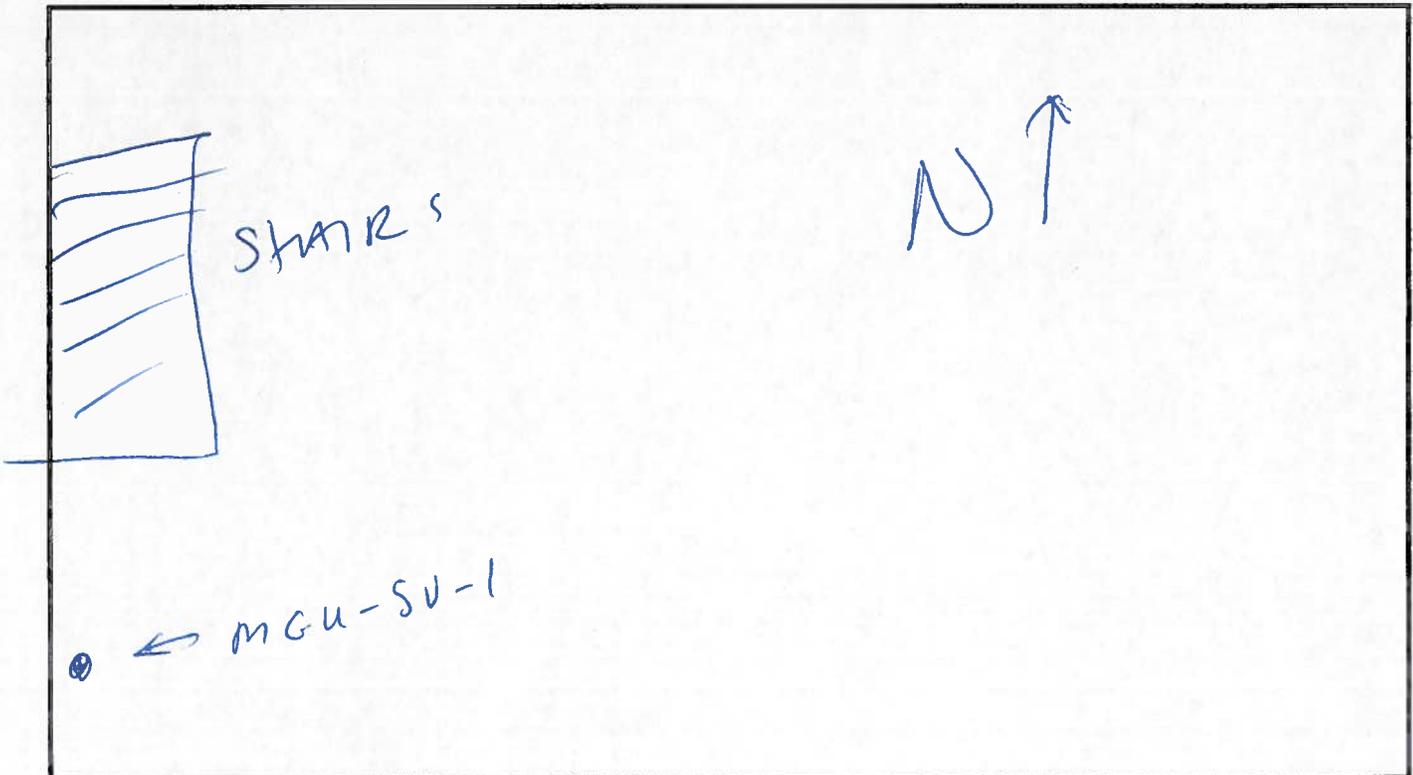
Comments:

## Air Sampling Data Sheet

Site Name: Mich. Gas Ut. 1  
 Company: **Tetra Tech EMI**  
 Client: **U.S. EPA Region 5**  
 Resident Address: 78 W. Chicago

Location:	Indoor Outdoor	Matrix:	SV AA
Sample ID No.:	<u>MGU-SV-1</u>	Floor/Level	<u>Basement</u>
Canister ID No.:	<u>0675</u>	Regulator ID No.	<u>2983</u>
Start Date / Time	<u>5/15 10:18</u>	End Date / Time	<u>5/16/14 9:04</u>
Starting Vacuum (in Hg)	<u>-<del>20</del> 27</u>	End Vacuum	<u>-1</u>
Temp - In (start)	<u>66° F</u>	Temp - In (stop)	<u>57</u>
Temp - Out (start)	<u>48 F</u>	Temp - Out (stop)	<u>39</u>
Baro. Press.- In (start)	_____	B.P. - In (stop)	_____
Baro. Press. - Out (start)	_____	B.P. - Out (stop)	_____
Sampler(s)	<u>Kevin Scott + Vadim Petrov</u>		

**Sketch**



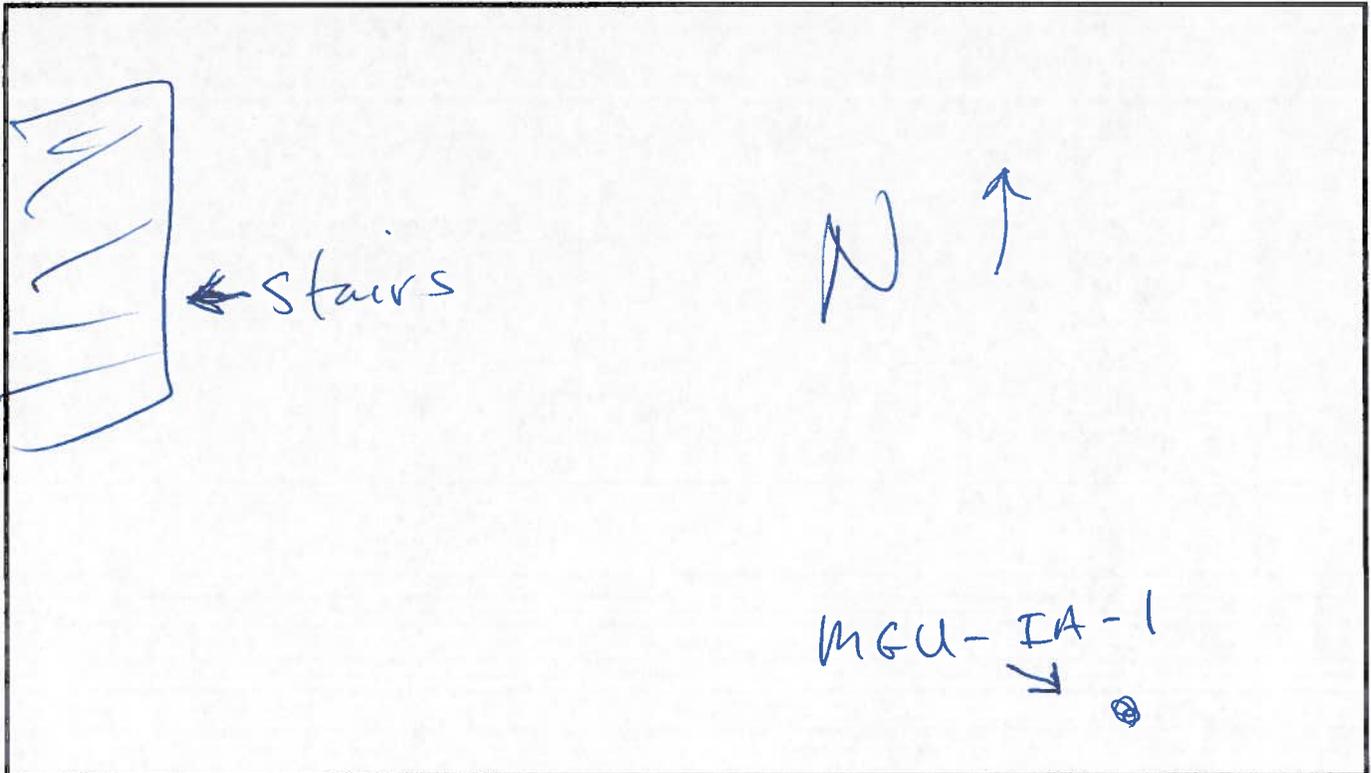
Comments:

# Air Sampling Data Sheet

Site Name: Mich Gas Util  
 Company: Tetra Tech EMI  
 Client: U.S. EPA Region 5  
 Resident Address: 78 W. Chicago St. Coklewater MI

Location:	<u>Indoor</u> Outdoor	Matrix:	SV <u>AA</u>
Sample ID No.:	<u>IA-1</u>	Floor/Level	_____
Canister ID No.:	<u>0280</u>	Regulator ID No.	<u>2864</u>
Start Date / Time	<u>5/15/14 1029</u>	End Date / Time	<u>5/16/14 0907</u>
Starting Vacuum (in Hg)	<u>-28.5</u>	End Vacuum	<u>0</u>
Temp - In (start)	<u>66</u>	Temp - In (stop)	<u>57</u>
Temp - Out (start)	<u>48</u>	Temp - Out (stop)	<u>39</u>
Baro. Press. - In (start)	_____	B.P. - In (stop)	_____
Baro. Press. - Out (start)	_____	B.P. - Out (stop)	_____
Sampler(s)	<u>Kevin Scott / Vadim Petrov</u>		

**Sketch**



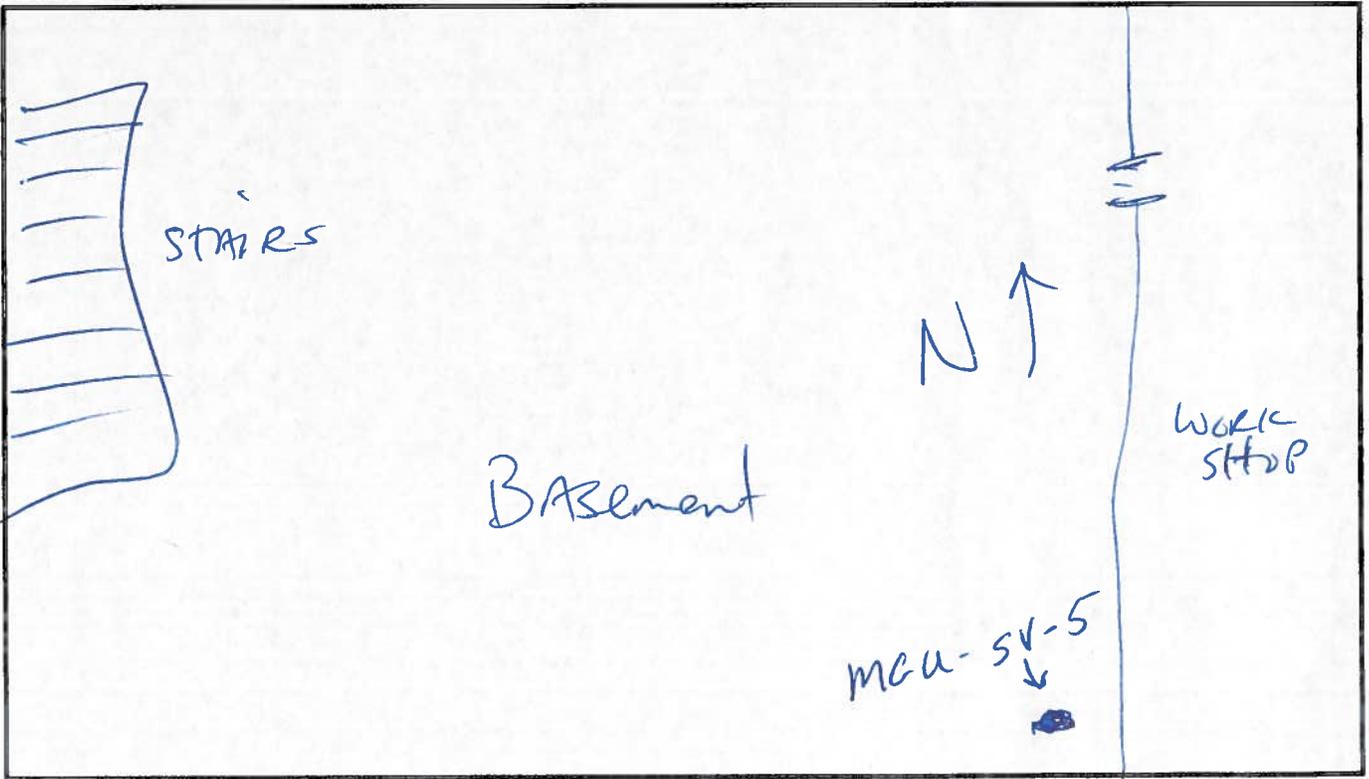
Comments:

# Air Sampling Data Sheet

Site Name: MICH GAS UTIL  
 Company: Tetra Tech EMI  
 Client: U.S. EPA Region 5  
 Resident Address: 78 W. Chicago St. Coldwater, MI

Location:	<u>Indoor</u> <del>Outdoor</del>	Matrix:	<u>SV</u> <del>AA</del>
Sample ID No.:	<u>MGU-SV-5</u>	Floor/Level	<u>Basement</u>
Canister ID No.:	<u>0666</u>	Regulator ID No.	<u>2960</u>
Start Date / Time	<u>5/16 10:25</u>	End Date / Time	<u>5/16 09:07</u>
Starting Vacuum (in Hg)	<u>-27.5</u>	End Vacuum	<u>-1</u>
Temp - In (start)	<u>66°F</u>	Temp - In (stop)	<u>57</u>
Temp - Out (start)	<u>48°F</u>	Temp - Out (stop)	<u>39</u>
Baro. Press. - In (start)	_____	B.P. - In (stop)	_____
Baro. Press. - Out (start)	_____	B.P. - Out (stop)	_____
Sampler(s)	<u>Kevin Scott / Vadim Petrov</u>		

**Sketch**



Comments:

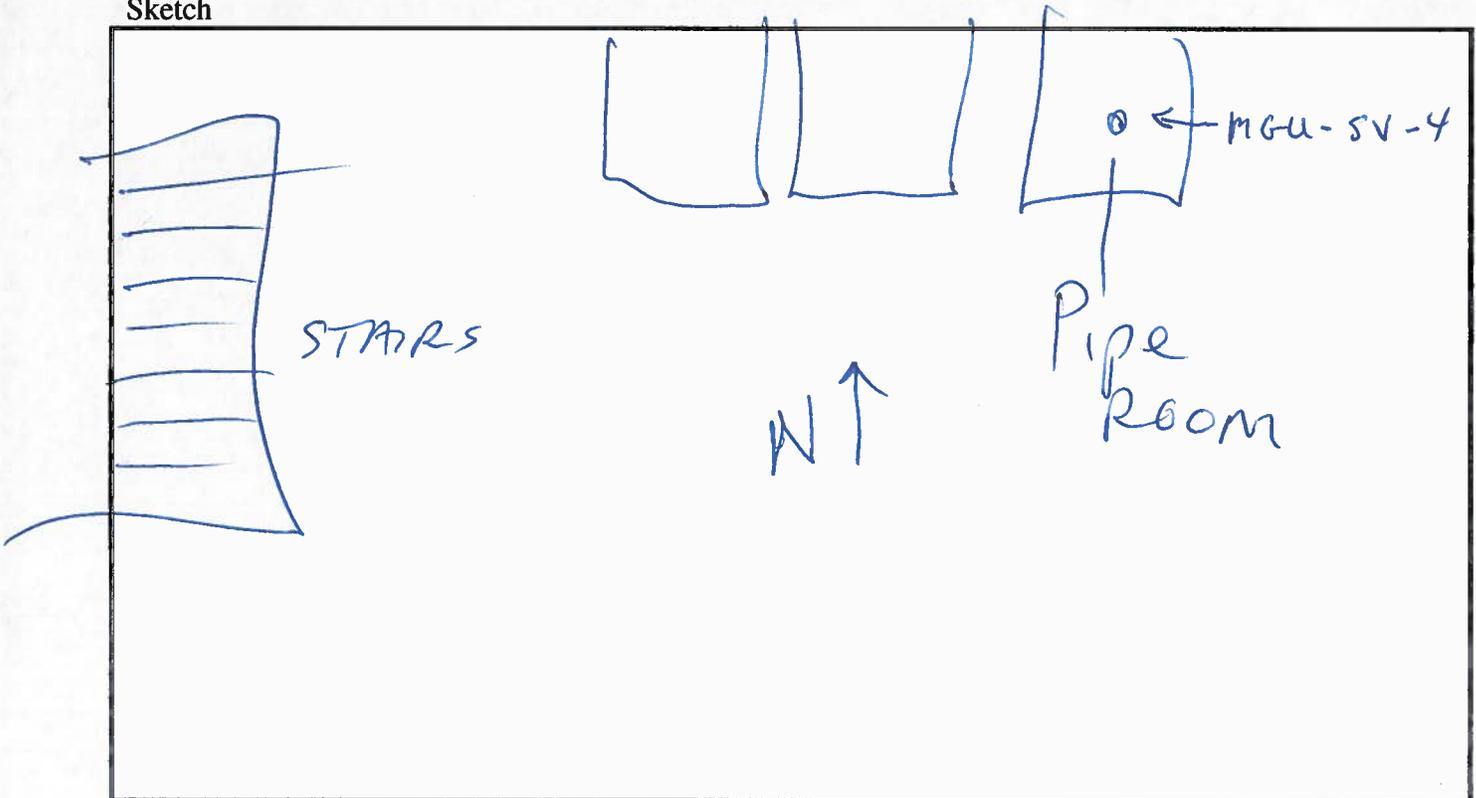


## Air Sampling Data Sheet

Site Name: MICH. GAS UTIL  
 Company: Tetra Tech EMI  
 Client: U.S. EPA Region 5  
 Resident Address: 78 W. Chicago St. Coldwater, MI

Location:	<input checked="" type="radio"/> Indoor <input type="radio"/> Outdoor	Matrix:	<input checked="" type="radio"/> SV <input type="radio"/> AA
Sample ID No.:	<u>MGU-SV-4</u>	Floor/Level	<u>Basement</u>
Canister ID No.:	<u>0242</u>	Regulator ID No.	<u>2968</u>
Start Date / Time	<u>5/15 10:22</u>	End Date / Time	<u>5/16/14 0950</u>
Starting Vacuum (in Hg)	<u>-31</u>	End Vacuum	<u>-22</u>
Temp - In (start)	<u>66</u>	Temp - In (stop)	<u>57</u>
Temp - Out (start)	<u>48</u>	Temp - Out (stop)	<u>39</u>
Baro. Press. - In (start)	_____	B.P. - In (stop)	_____
Baro. Press. - Out (start)	_____	B.P. - Out (stop)	_____
Sampler(s)	<u>Kevin Scott / Vadim Petrov</u>		

**Sketch**



Comments:

Vapor Intrusion Sample Port  
Leak Test Data Sheet

Site Name: Michigan Gas Util.  
Company **Tetra Tech EMI**  
Client: **U.S. EPA Region 5**  
Resident Address: 78 W

Sample ID:

Leak test type: helium tracer / alcohol tracer (circle one)

Pre / Post sample (circle one)

Date: 5/15/2014

Time: 10:00

Helium Concentration measured inside leak test chamber 49.7%

Helium Concentration measured in air sample 0.00 ppm

**APPENDIX E**  
**SAMPLE CHAIN-OF-CUSTODY RECORD**



SPECTRUM ANALYTICAL, INC.  
Featuring  
HANIBAL TECHNOLOGY

# Chain of Custody Record/Field Test Data Sheets for Air Analyses

**Special Handling:**  
 Standard TAT - 7 to 10 business days  
 Rush TAT - Date Needed: \_\_\_\_\_

All TATs subject to laboratory approval.  
 Min. 24-hour notification needed for rushes.

Page 1 of 1

Report To: <u>Kevin Scott</u>		Invoice To: <u>SATRA</u>		Project No.: <u>10349022</u>				Analysis		Matrix		Check box if canister is returned unused							
<u>Tetra Tech TNC</u>				Site Name: <u>MICHIGAN GAS MILL</u>				TO-15 Low Level	24HR TAT	5 DAY TAT	Indoor / Ambient Air		Soil Gas						
<u>15 Wacker Dr. 57th Floor</u>				Location: <u>Coldwater</u> State: <u>MI</u>															
<u>Chicago, IL 60606</u>				Sampler(s): <u>Kevin Scott</u>															
Tel #: <u>856 217 6072</u>		Attn:		P.O. No.: _____ RQN: <u>VACUUM PERKOV</u>															
Project Manager: <u>Kevin Scott</u>		P.O. No.:		RQN:															
Can ID	Can Size (L)	Outgoing Canister Pressure ("Hg) (Lab)	Incoming Canister Pressure ("Hg) (Lab)	Flow Reg. ID	Flow Controller Readout (m/min)	Lab Id:	Sample Id:	Sample Date(s)	Time Start (24 hr clock)	Time Stop (24 hr clock)	Canister Pressure in Field ("Hg) (Start)	Canister Pressure in Field ("Hg) (Stop)	Interior Temp. (F) (Start)	Interior Temp. (F) (Stop)					
LABORATORY USE ONLY																			
<u>0466</u>	<u>6</u>	<u>-30</u>		<u>2960</u>	<u>3.09</u>		<u>MGU-SV-5</u>	<u>5/15/14</u>	<u>10:25</u>	<u>0907</u>	<u>-27.5</u>	<u>-1</u>	<u>66</u>	<u>57</u>					
<u>0488</u>	<u>6</u>	<u>-30</u>		<u>2891</u>	<u>3.16</u>		<u>MGU-SV-2</u>	<u>5/15/14</u>	<u>10:20</u>	<u>0909</u>	<u>-29</u>	<u>-0.5</u>	<u>66</u>	<u>57</u>					
<u>0207</u>	<u>6</u>	<u>-30</u>		<u>2889</u>	<u>3.13</u>		<u>MGU-OA-1</u>	<u>5/15/14</u>	<u>10:34</u>	<u>0851</u>	<u>-28</u>	<u>-2</u>							
<u>0242</u>	<u>6</u>	<u>-30</u>		<u>2968</u>	<u>3.07</u>		<u>MGU-SV-4</u>	<u>5/15/14</u>	<u>10:22</u>	<u>0950</u>	<u>-31</u>	<u>-22</u>	<u>66</u>	<u>57</u>					
<u>0675</u>	<u>6</u>	<u>-30</u>		<u>2983</u>	<u>3.14</u>		<u>MGU-SV-1</u>	<u>5/15/14</u>	<u>10:18</u>	<u>0904</u>	<u>-27</u>	<u>-1</u>	<u>66</u>	<u>57</u>					
<u>0280</u>	<u>6</u>	<u>-30</u>		<u>2864</u>	<u>3.19</u>		<u>MGU-IA-1</u>	<u>5/15/14</u>	<u>10:24</u>	<u>0907</u>	<u>28.5</u>	<u>0</u>	<u>66</u>	<u>57</u>					
<u>0271</u>	<u>6</u>	<u>-30</u>		<u>2975</u>	<u>3.13</u>		<u>MGU-IA-2</u>	<u>5/15/14</u>	<u>10:18</u>	<u>0904</u>	<u>28</u>	<u>0</u>	<u>66</u>	<u>57</u>					
<u>4626</u>	<u>6</u>	<u>-30</u>		<u>2999</u>	<u>3.08</u>		<u>MGU-SV-3</u>	<u>5/15/14</u>	<u>10:21</u>	<u>0910</u>	<u>-31</u>	<u>-11.5</u>	<u>66</u>	<u>57</u>					
Date of Request: <u>5/13/14</u>		Total # Canisters: <u>8</u>		QA/QC Reporting Level:				Client Use		Ambient Temperature (Fahrenheit)		Ambient Pressure (inches of Hg)							
Requested by: <u>Kevin Scott</u>		# LL Canisters: <u>8</u>		<input checked="" type="checkbox"/> Standard <input type="checkbox"/> NY ASP A* <input type="checkbox"/> TIER II* <input type="checkbox"/> MA DEP CAM				Start		<u>48</u>									
Company: <u>Tetra Tech</u>		# Flow Controllers: <u>8</u>		<input type="checkbox"/> NO QC <input type="checkbox"/> NY ASP B* <input type="checkbox"/> TIER IV* <input type="checkbox"/> CT DPH RCP				Stop											
Location: <u>Coldwater, MI</u>		Flow Rate/Setting: <u>2 L/min</u>		<input type="checkbox"/> DQA* <input type="checkbox"/> additional charges may apply contact SA's QA Department for further info.															
Date Needed: <u>5/16/14</u> Order #: <u>31254</u> Prepared by: <u>BRP</u>		Special Instructions/QC Requirements & Comments:																	
I attest that all media relinquished from Spectrum Analytical, Inc. have been received in good working condition, based on visual observation, and agree to the terms and conditions as listed on the back of this document. Signed: <u>K Scott</u> Date: <u>5/15/14</u>				<u>VACUUM GAUGE for CAN ID 4626 Initial reading -4 micro start</u>															
				<u>SAMPLE DATES START 5/15/14 END: 5/16/14</u>															
				<u>24-HOUR TAT NEEDED - 2 MGU-TA-1 - 2 MGU-IA-2 - 5 DAY TAT for ALL OTHERS</u>															
Printed: <u>Kevin Scott</u>				Please contact SA's Air Department immediately at (800) 789-9115 if you experience any technical difficulties or suspect any QC issue(s) with air media.															
Relinquished by:		Received by:		Date:		Time:		<input type="checkbox"/> EDD Format		<u>LPA Region 2</u>									
<u>K Scott</u>		<u>red 458</u>		<u>5/16/14</u>				<input type="checkbox"/> E-mail Results to		<u>Kevin.Scott@tetratech.com</u>									

3906

5089526 AME



SPECTRUM ANALYTICAL, INC.  
Featuring  
HANIBAL TECHNOLOGY

# CHAIN OF CUSTODY RECORD

Page 1 of 1

### Special Handling:

- Standard TAT - 7 to 10 business days
  - Rush TAT - Date Needed: \_\_\_\_\_
- All TATs subject to laboratory approval  
Min. 24-hr notification needed for rushes  
Samples disposed after 60 days unless otherwise instructed.

Report To: KEVIN SCOTT  
Tetra Tech Inc  
1 S. Wacker Dr. 37th Floor  
Chicago IL 60606

Telephone #: 856.217.6072  
Project Mgr: Kevin SCOTT

Invoice To: KEVIN SCOTT  
Tetra Tech, Inc  
1 S. Wacker Dr. 37th Fl.  
Chicago, IL 60606

P.O No.: 31254 Quote/RQN: \_\_\_\_\_

Project No: 103X9026000

Site Name: \_\_\_\_\_

Location: \_\_\_\_\_ State: \_\_\_\_\_

Sampler(s): \_\_\_\_\_

F=Field Filtered 1=Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub> 2=HCl 3=H<sub>2</sub>SO<sub>4</sub> 4=HNO<sub>3</sub> 5=NaOH 6=Ascorbic Acid  
7=CH<sub>3</sub>OH 8=NaHSO<sub>4</sub> 9=Deionized Water 10=H<sub>3</sub>PO<sub>4</sub> 11= \_\_\_\_\_ 12= \_\_\_\_\_

### List Preservative Code below:

### QA/QC Reporting Notes:

\* additional charges may apply

DW=Dinking Water GW=Groundwater SW=Surface Water WW=Waste Water  
O=Oil SO=Soil SL=Sludge A=Indoor/Ambient Air SG=Soil Gas

X1= \_\_\_\_\_ X2= \_\_\_\_\_ X3= \_\_\_\_\_

### Containers

### Analysis

Lab ID:	Sample ID:	Date:	Time:	Type	Matrix	Containers				Check if chlorinated	Analysis									
						# of VOA Vials	# of Amber Glass	# of Clear Glass	# of Plastic											
508952601	MGU-SG-1	5/15/14	13:18	SG																
-02	MGU-SG-2	5/15/14	13:22	SG																
-03	MGU-SG-3	5/15/14	13:45	SG																

1/1/IR

Relinquished by:	Received by:	Date:	Time:	Temp °C
<u>Kevin SCOTT</u>	<u>FedEx</u>	<u>5/15/14</u>	<u>1530</u>	<u>21.9</u>
<u>fed ex</u>	<u>JUH</u>	<u>5/16/14</u>	<u>1010</u>	<u>0</u>
				<u>21.9</u>
				<u>01</u>

EDD format: EPA R2

E-mail to: Kevin.Scott@tetratech.com

Condition upon receipt: Custody Seals:  Present  Intact  Broken

Ambient  Iced  Refrigerated  DI VOA Frozen  Soil Jar Frozen

**APPENDIX F**  
**PHOTOGRAPHIC DOCUMENTATION LOG**



## **Photographic Documentation**

**Client:** U.S. EPA Region 5  
**Site Name:** Michigan Gas Utilities  
**Location:** 78 W. Chicago St., Coldwater, MI  
**Date:** May 14 and 15, 2014

**Prepared by:** Tetra Tech, Inc.  
**Photographer:** Vadim Petrov  
**TDD Number:** S05-0001-1405-006

### **Photograph No. 1**

**Photograph Date:** 5/14/15

**Photograph Time:** 7:53

**Description:** Photo showing the front view of the property.



### **Photograph No. 2**

**Photograph Date:** 5/15/14

**Photograph Time:** 7:52

**Description:** Photo showing the rear of the property.





## **Photographic Documentation**

**Client:** U.S. EPA Region 5  
**Site Name:** Michigan Gas Utilities  
**Location:** 78 W. Chicago St., Coldwater, MI  
**Date:** May 14 and 15, 2014

**Prepared by:** Tetra Tech, Inc.  
**Photographer:** Vadim Petrov  
**TDD Number:** S05-0001-1405-006

### **Photograph No. 3**

**Photograph Date:** 5/14/14

**Photograph Time:** 17:53

**Description:** Photo shows installation of a sub-slab sampling port in pipe room.



### **Photograph No. 4**

**Photograph Date:** 5/14/14

**Photograph Time:** 18:04

**Description:** Photo shows a view of completed sampling port in pipe room (Sample Location MGU-SV-4).





## **Photographic Documentation**

**Client:** U.S. EPA Region 5  
**Site Name:** Michigan Gas Utilities  
**Location:** 78 W. Chicago St., Coldwater, MI  
**Date:** May 14 and 15, 2014

**Prepared by:** Tetra Tech, Inc.  
**Photographer:** Vadim Petrov  
**TDD Number:** S05-0001-1405-006

### **Photograph No. 5**

**Photograph Date:** 5/14/14

**Photograph Time:** 18:42

**Description:** Photo shows Tetra Tech personnel collecting air quality readings from a sampling port installed in southeast corner of the basement (Sample Location MGU-SV-5).



### **Photograph No. 6**

**Photograph Date:** 5/15/14

**Photograph Time:** 9:46

**Description:** Photo shows a view of completed sampling port installed in wine room (Sample ID MGU-SV-2 and MGU-SV-3 [duplicate pair]).





## **Photographic Documentation**

**Client:** U.S. EPA Region 5  
**Site Name:** Michigan Gas Utilities  
**Location:** 78 W. Chicago St., Coldwater, MI  
**Date:** May 14 and 15, 2014

**Prepared by:** Tetra Tech, Inc.  
**Photographer:** Vadim Petrov  
**TDD Number:** S05-0001-1405-006

### **Photograph No. 7**

**Photograph Date:** 5/15/14

**Photograph Time:** 9:52

**Description:** Photo shows Tetra Tech personnel performing pre-sampling helium leak test on a sampling port installed in wine room (Sample ID MGU-SV-2 and MGU-SV-3 [duplicate pair]).



### **Photograph No. 8**

**Photograph Date:** 5/15/14

**Photograph Time:** 10:26

**Description:** Photo shows two Summa canisters placed in southeast corner of the basement to collect samples of indoor ambient air (Sample ID MGU-IA-1) and sub-slab soil vapor (Sample ID MGU-SV-5).





## **Photographic Documentation**

**Client:** U.S. EPA Region 5  
**Site Name:** Michigan Gas Utilities  
**Location:** 78 W. Chicago St., Coldwater, MI  
**Date:** May 14 and 15, 2014

**Prepared by:** Tetra Tech, Inc.  
**Photographer:** Vadim Petrov  
**TDD Number:** S05-0001-1405-006

### **Photograph No. 9**

**Photograph Date:** 5/15/14

**Photograph Time:** 10:26

**Description:** Photo shows a Summa canister placed in pipe room to collect a sample of sub-slab soil vapor (Sample Location MGU-SV-4).



### **Photograph No. 10**

**Photograph Date:** 5/15/14

**Photograph Time:** 10:27

**Description:** Photo show two collocated Summa canisters placed in wine room to collect samples of sub-slab soil vapor (Sample ID MGU-SV-2 and MGU-SV-3 [duplicate pair]).





## **Photographic Documentation**

**Client:** U.S. EPA Region 5  
**Site Name:** Michigan Gas Utilities  
**Location:** 78 W. Chicago St., Coldwater, MI  
**Date:** May 14 and 15, 2014

**Prepared by:** Tetra Tech, Inc.  
**Photographer:** Vadim Petrov  
**TDD Number:** S05-0001-1405-006

### **Photograph No. 11**

**Photograph Date:** 5/15/14

**Photograph Time:** 10:27

**Description:** Photo shows a Summa canister placed along the west wall of basement to collect a sample of sub-slab soil vapor (Sample Location MGU-SV-1).



### **Photograph No. 12**

**Photograph Date:** 5/15/14

**Photograph Time:** 10:27

**Description:** Photo shows a Summa canister placed on a table in the west room of the basement to collect a sample of sub-slab soil vapor (Sample Location MGU-IA-2).





## **Photographic Documentation**

**Client:** U.S. EPA Region 5  
**Site Name:** Michigan Gas Utilities  
**Location:** 78 W. Chicago St., Coldwater, MI  
**Date:** May 14 and 15, 2014

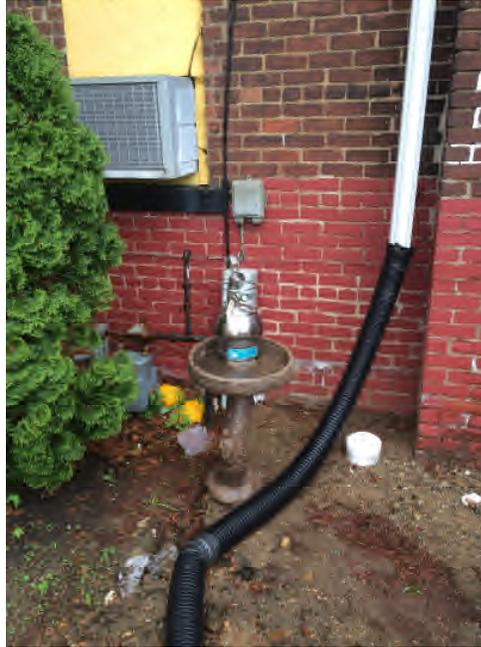
**Prepared by:** Tetra Tech, Inc.  
**Photographer:** Vadim Petrov  
**TDD Number:** S05-0001-1405-006

### **Photograph No. 13**

**Photograph Date:** 5/15/14

**Photograph Time:** 10:34

**Description:** Photo shows a Summa canister placed outside in the backyard of the property to collect a sample of outdoor ambient air (Sample Location MGU-OA-1).



### **Photograph No. 14**

**Photograph Date:** 5/15/14

**Photograph Time:** 13:10

**Description:** Photo shows collection of a grab soil gas sample in the backyard and adjacent to the building (Sample Location MGU-SG-1).





## ***Photographic Documentation***

**Client:** U.S. EPA Region 5

**Site Name:** Michigan Gas Utilities

**Location:** 78 W. Chicago St., Coldwater, MI

**Date:** May 14 and 15, 2014

**Prepared by:** Tetra Tech, Inc.

**Photographer:** Vadim Petrov

**TDD Number:** S05-0001-1405-006

**Photograph No. 15**

**Photograph Date:** 5/15/14

**Photograph Time:** 13:42

**Description:** Photo shows collection of a grab soil gas sample in the backyard near the property boundary, away from the building (Sample Location MGU-SG-3).



**ATTACHMENT A**  
**MICHIGAN GAS UTILITIES CORPORATION FORMER CHICAGO STREET**  
**MGP REMEDIAL INVESTIGATION III SUPPLEMENTAL REPORT,**  
**PREPARED BY PESCADOR, LLC**

EV

# Michigan Gas Utilities Corporation Former Chicago Street MGP Remedial Investigation III Supplemental Report

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Pescador Project No. 755

April 30, 2014

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## **1.0 INTRODUCTION**

### **1.1 Project Objectives**

The purpose of this Limited Remedial Investigation (RI) III conducted in June 2012 is to further evaluate potential soil and groundwater contamination in the vicinity of suspected MGP process foundations and to evaluate soil and groundwater contamination downgradient of the Michigan Gas Utilities (MGU) former Coldwater Chicago Street Manufactured Gas Plant (MGP) site located in Coldwater, Michigan. The findings of this RI III will be used to evaluate areas to excavate contaminated soil from the subject property as part of a planned remedial excavation of MGP source areas.

In 2010, Pescador LLC (Pescador) completed the initial remedial investigation at the site in the area of the MGP's former facility operations located in the Upson Plaza parking facility. During the investigation, Pescador was able to:

- Identify three underground and one aboveground gasholder foundations;
- Determine depth to groundwater; and
- Evaluate groundwater flow direction.

However, Pescador was unable to secure access to the former MGP administrative building property located at 78 West Chicago Street until August 2011. At that time, Pescador completed six soil borings to evaluate the property for contamination related to former MGP process areas and foundations in that area.

### **1.2 Site Location and General Description**

The former Coldwater Chicago Street MGP is located on West Chicago Street between North Hanchett Street and North Clay Street, Coldwater, Branch County, Michigan. Properties surrounding the former MGP are commercial with private residences to the north. Figure 1 shows the site location and surrounding area.

The former Coldwater Chicago Street MGP administrative building was located on the parcel now identified as 78 West Chicago Street. The former administrative building is currently owned by a private party. The property that held the majority of the MGP processes and operations is currently owned by the City of Coldwater and is referred to as the Upson Plaza Parking Facility. The former MGP facility operations area occupies approximately one acre of land centrally located within the city block. Figure 2 shows the approximate location of the former MGP facility operations with respect to the parking facility and 78 West Chicago Street.

### **1.3 Site Background**

Between the late 1870s to early 1880s, the Coldwater Gas Company purchased the Coldwater MGP property and began producing manufactured gas from coal. The Coldwater Gas Company operated the MGP on this property from the early 1880s through approximately 1923. In 1922, National Utilities Company (NUC) bought a separate parcel of land to the south of the downtown Coldwater area on Race Street and began to relocate the manufacturing process in 1922. By the early to mid-1920s, NUC had discontinued the production of manufactured gas on the Chicago

Street property; however, they continued to utilize the storefront and offices at the 78 West Chicago Street address into the late 1960s or early 1970s.

The Coldwater Gas Company manufactured gas from coal utilizing a carbonization process during the early 1880s through approximately 1923. The coal carbonization process consisted of heating bituminous coal in sealed chambers referred to as 'coke ovens' or 'retorts'. This process distilled and carbonized the coal to produce gas and coke. The gas was collected and stored onsite in gasholders prior to its purification and subsequent distribution. The coke was collected and sold and/or used on site. The raw gas was cleaned in purifiers to remove impurities that would degrade pipelines, appliances, and gas lamps. Figure 3 shows a historical Sanborn map from 1922 indicating the approximate locations of historical MGP features on the subject property.

The coke, tar, and oils generated as byproducts through the distillation process were generally sold separately from the MGP. Other materials such as sludge, purifier or oxide box materials, wastewater, and ash were residual waste derived from the process. During plant operation, coal tar was present in tar wells/tar tanks, tar separators, the purifiers, and within the gasholders. The coal tar was often sold for other uses, such as roofing tar or wood preservative. Occasionally, light oils were removed from the coal tar and sold separately.

The residual waste and coal tar produced during the distillation process contained benzene, toluene, ethylbenzene and xylenes (BTEX), trimethylmethylbenzene isomers (TMBs), polynuclear aromatic hydrocarbons (PNAs), phenols, cyanide, and other metals.

#### **1.4 Site Geology and Hydrogeology**

The former Chicago Street MGP is situated in a region of minimal topographic relief. The soil types encountered at the site consist primarily of clayey sand to approximately 5 feet (ft) below surface grade (bsg) followed by fine to coarse sand with fine gravel to depth of boring. Soil descriptions are included on the soil boring logs provided in Appendix A.

Depth to groundwater fluctuates seasonally, but is approximately 18 ft to 20 ft bsg. The shallow groundwater flow direction is to the west-northwest based on the groundwater elevation data collected during the June 2010 remedial site investigation as indicated on Figure 4.

A series of lakes are located approximately 1.3 miles west of the former Chicago Street MGP at an elevation of approximately 950 ft amsl. The Sauk River is located approximately 0.5 mile to the south-southwest of the site and flows westerly toward the lakes and the Coldwater River.

## **2.0 SITE INVESTIGATION ACTIVITIES**

### **2.1 Soil Sampling – Soil Probe/Hand Auger Borings**

In June 2012 and September 2013, Pescador advanced 19 borings and 6 borings, respectively. Borings SB-22 through SB-44 were completed in June 2012 and borings SB-45 through SB-50 were completed in September 2013. Soil borings SB-42, SB-43, SB-44 were completed as monitoring wells MW1S, MW-1I and MW-1D, respectively. The soil boring/monitoring well locations are illustrated on Figure 2.

During the June 2012 site investigation, a Geoprobe® was used to advance 5 ft long samplers to recover soil cores from each boring. During the September 2013 site investigation, a Geoprobe® was used to collect samples at the SB-47 location only. Borings SB-48 through SB-50 were advanced manually using a hand auger. These borings were used to locate the foundations of the gasholders.

In the Geoprobe® borings, continuous soil cores were obtained beginning at surface grade to the depth of saturation encountered at approximately 20 ft bsg. The soil cores were monitored for the presence of organic vapors with a photo-ionization detector (PID) and the readings were recorded. The PID meter was calibrated with fresh air and then calibrated with isobutylene gas prior to use. The PID readings are recorded on the soil boring logs provided in Appendix A.

Surface soil samples were collected immediately beneath the asphalt sub-base gravel layer that occurred at depths ranging from 0.5 to 1.5 ft bsg. Subsurface soil samples were collected at each of the boring locations from the interval exhibiting the highest PID reading and/or discoloration at discrete depths above the capillary fringe. Soil samples collected at or near former MGP process locations were obtained from a depth relative to the total depth of the process (e.g., base of subsurface foundations).

A total of 39 soil samples were collected, placed into labeled containers and kept on ice until the samples were shipped to a laboratory for analysis. During the site investigation activities, Pescador collected soil samples for analysis of the following list of compounds:

- Volatile organic compounds (VOCs) using United States Environmental Protection Agency (USEPA) Method 8260. The soil samples collected for VOC analysis were preserved with methanol following USEPA Method 5035;
- Semi-volatile organic compounds (SVOCs) including PNAs and phenols using USEPA Method 8270;
- Available cyanide using OIA Method 1677;
- Michigan 10 Metals which include arsenic, barium, cadmium, chromium, copper, lead, mercury, selenium, silver, and zinc by USEPA Methods 6020/7470/7471; and
- Ammonia using USEPA Method 350.1.

The majority of the soil samples were collected near the gasholders in the asphalt parking area adjacent to the north of the current building located at 78 West Chicago Street. Soil borings and sampling could not be conducted at the American Legion building adjacent to the west of 78 West Chicago Street due to physical constraints of accessing the property with the drill rig. As a result, soil borings SB-35 through SB-38 were completed on the former Standard Oil property adjacent to the west of the American Legion building.

Table 1 is a sample matrix showing soil sample depths and corresponding analytical parameters. Table 2 provides survey data of the soil borings completed during the 2012 and 2013 remedial investigations. The soil analytical results are presented in Tables 3 and 4 and illustrated on Figures 5 and 6.

## 2.2 Groundwater Sampling – Soil Probe Borings

Groundwater samples were collected during the June 2012 site investigation and September 2013 site investigation as follows:

- June 2012: SB-30, SB-31, SB-34, SB-36, SB-38, SB-40, SB-41/MW-1S, SB-42/MW-1I, and SB-43/MW-1D
- September 2013: SB-47

Groundwater samples were collected from the soil borings either through the soil probe drilling rods using a retractable well screen or installing temporary monitoring wells to facilitate sample collection.

A total of seven groundwater samples were collected from the soil boring locations, placed into labeled containers and kept on ice until the samples were shipped to a laboratory for analysis. During the site investigation activities, Pescador collected groundwater samples for analysis of the following list of compounds:

- VOCs using USEPA Method 8260;
- SVOCs including PNAs and phenols using USEPA Method 8270;
- Available cyanide using OIA Method 1677;
- Michigan 10 Metals which include arsenic, barium, cadmium, chromium, copper, lead, mercury, selenium, silver, and zinc. Groundwater samples were analyzed for total metals by USEPA 200.8 and USEPA 245.1; and
- Ammonia using method SM4500 NH<sub>3</sub>G.

The analytical results from the groundwater samples obtained from the soil borings are summarized in Table 5 and illustrated on Figure 7.

## 2.3 Monitoring Well Installation

A nested group of three monitoring wells was installed in June 2012. The newly-installed monitoring wells were identified as MW-1S, MW-1I, and MW-1D.

The wells were constructed of 2-inch diameter, Schedule 40, polyvinyl chloride (PVC) casing coupled to a 5-ft long, #10 slot, PVC well screen and completed as follows:

- The formation was allowed to collapse around the well screen from the bottom elevation of the well screen to approximately five ft above the top elevation of the well screen interval.
- Bentonite chips were placed in the annular space above the sand pack.
- The wells were secured at the surface with an expandable, locking cap and a flush mount cover cemented in place.

After installation, the wells were developed by using the surge and pump method. The development was considered complete when the evacuated water was relatively free of sediment. The well construction details are included on the soil boring logs in Appendix A.

## 2.4 Site Survey

The locations and/or elevations of the soil borings, monitoring wells, existing buildings, and utilities were surveyed. The newly-installed monitoring wells and soil borings were surveyed to establish the vertical elevation and horizontal position. Top of casing elevations were surveyed to the nearest 0.01 ft and the ground surface to the nearest 0.1 ft. The top-of-casing and ground elevations are included in Table 2.

## 2.4 Groundwater Sampling – Monitoring Wells

Groundwater samples were collected from the monitoring wells on June 21, 2012, October 15, 2012, April 24, 2013, and September 23, 2013. The sampling events included collection of groundwater samples from monitoring wells MW-1S, MW-1I, and MW-1D. The samples were submitted for analysis of the following list of compounds:

- VOCs using USEPA Method 8260;
- SVOCs including PNAs and phenols using USEPA Method 8270;
- Available cyanide using OIA Method 1677;
- Michigan 10 Metals including arsenic, barium, cadmium, chromium, copper, lead, mercury, selenium, silver, and zinc. Groundwater samples were analyzed for total metals by USEPA 200.8 and USEPA 245.1;
- Ammonia using Method SM4500 NH3G;
- Total cyanide using USEPA Method 9010; and
- Total sulfide using Method SM4500 S2F.

Prior to collecting the groundwater samples from the monitoring wells, the depth to groundwater was measured to the nearest 0.01-ft and recorded. The low flow sampling method was employed to collect the groundwater samples. A variable speed peristaltic sampling pump capable of purging less than 500 milliliters per minute was used. While purging, the geochemical parameters were monitored using a multiparameter meter and the values were recorded. The geochemical parameters included temperature, pH, specific conductance, dissolved oxygen, oxidation/reduction potential, and turbidity.

The groundwater elevations for the sampling events are found in Table 2 and the analytical results for the groundwater samples obtained from the monitoring wells are summarized in Table 6 and illustrated on Figure 7.

## 3.0 RESULTS AND DISCUSSION

Laboratory analytical results exceeding one or more of the applicable Part 201 Nonresidential cleanup criteria for surface soil samples, subsurface soil samples and groundwater samples are summarized in Tables 3, 4, 5 and 6, and illustrated on Figures 5, 6, and 7. The footnotes used on the aforementioned tables are included in Appendix B.

### 3.1 Surface Soil Sample Results

At the Coldwater Chicago Street MGP site, 16 surface soil samples were collected from depths ranging from 0.5 ft to 2.5 ft bsg. The analytical results indicated that analyzed parameters were detected at concentrations that exceeded Nonresidential cleanup criteria as indicated in the following table:

ANALYTE	NRDWP	NRSVIAI	NRVSIC	NRDC
Arsenic	X			
Mercury	X			
Benzene	X	X	X	
Tetrachloroethene	X			
Toluene	X			
1,2,4-Trimethylbenzene	X			
1,3,5-Trimethylbenzene	X			
Xylenes	X	X		
Acenaphthylene	X			
Anthracene	X			
Benzo(a)anthracene				X
Benzo(b)fluoranthene				X
Benzo(a)pyrene				X
Dibenzo(a,h)anthracene				X
Indeno(1,2,3-cd)pyrene				X
2-Methylnaphthalene	X			
Naphthalene	X	X	X	
Phenanthrene	X		X	
Pyrene	X			

NRDWP – Nonresidential Drinking Water Protection Criteria

NRSVIAI – Nonresidential Soil Volatilization to Indoor Air Inhalation Criteria

NRVSIC – Nonresidential Infinite Source Volatile Soil Inhalation Criteria

NRDC – Nonresidential Direct Contact Criteria

The soil boring locations with contaminant concentrations exceeding NRDWP criteria in the surface soil samples include:

- SB-22, SB-23, SB-24, SB-25, SB-26, SB-27, SB-28, SB-29, SB-30, SB-31, SB-33, SB-34, SB-36, SB-38, SB-40, and SB-41.

The soil boring location with contaminant concentrations exceeding NRSVIAI criteria in the surface soil sample was SB-28. The soil boring locations with contaminant concentrations exceeding NRVSIC criteria in the surface soil samples include SB-28, SB-34, and SB-40. The soil boring locations with contaminant concentrations exceeding NRDC criteria in the surface soil samples include SB-26, SB-28, SB-34, and SB-40.

The surface soil sample analytical results are summarized in Table 3 and illustrated on Figure 5.

### 3.2 Subsurface Soil Sample Results

At the Coldwater Chicago Street MGP site, 23 subsurface soil samples were collected from depths ranging from 5 ft to 20 ft bsg. The analytical results indicated that analyzed parameters were detected at concentrations that exceeded applicable Nonresidential cleanup criteria as indicated in the following table:

ANALYTE	NRDWP	NRSVIAI	NRVSIC	NRDC
Arsenic	X			
Benzene	X	X	X	X
Tetrachloroethene	X			
Toluene	X	X		
1,2,4-Trimethylbenzene	X			
Xylenes	X	X		
Acenaphthylene	X			
Anthracene	X			
Benzo(a)anthracene				X
Benzo(b)fluoranthene				X
Benzo(a)pyrene				X
Dibenzo(a,h)anthracene				X
2-Methylnaphthalene	X			
Naphthalene	X	X	X	
Phenanthrene	X		X	
2,4-Dimethylphenol	X			
2-Methylphenol (o-cresol)	X			
3&4-Methylphenol (m&p-cresol)	X			

The soil boring locations with contaminant concentrations exceeding NRDWP criteria in the subsurface soil samples include:

- SB-22, SB-23, SB-24, SB-25, SB-27, SB-28, SB-29, SB-31, SB-33, SB-34, SB-35, SB-36, SB-37, SB-38, SB-39, SB-40, SB-41 and SB-47.

The soil boring location with contaminant concentrations exceeding NRSVIAI criteria in the subsurface soil sample was SB-28. The soil boring locations with contaminant concentrations exceeding NRVSIC criteria in the subsurface soil samples include SB-28 and SB-34. The soil boring locations with contaminant concentrations exceeding NRDC criteria in the subsurface soil samples include SB-28 and SB-34.

The subsurface soil sample analytical results are summarized in Table 4 and illustrated on Figure 6.

### 3.3 Groundwater Sample Results

At the Coldwater Chicago Street MGP site, 19 groundwater samples were collected from soil borings and monitoring wells at various times. The analytical results indicated that analyzed parameters were detected at concentrations that exceeded Nonresidential cleanup criteria as indicated in the following table:

ANALYTE	NRDW
Arsenic	X
Tetrachloroethene	X

#### NRDW – Nonresidential Drinking Water Criteria

Groundwater samples with contaminant concentrations exceeding NRDW criteria include SB-31, SB-34, SB-36, SB-40, and SB-47. The groundwater analytical results for the soil borings and monitoring wells are summarized in Tables 5 and 6, and illustrated on Figure 7.

## 4.0 CLEANUP CRITERIA EVALUATION

### 4.1 Applicable Criteria Evaluation

The City of Coldwater has classified the zoning for this property and adjoining properties as C-2 Central Business District. This Zoning District encompasses the entertainment, meeting, and centralized shopping and merchandising activities of the community with limited residential and office needs. Referencing MDEQ Op Memo #18, the various land use categories and respective generic cleanup criteria were determined. The evaluation of the soil and groundwater contaminant concentrations will be compared to Nonresidential cleanup criteria based on the zoning of the current and adjacent properties.

### 4.2 Exposure Pathway Analysis

A complete exposure pathway will result if the target cleanup criteria have been exceeded and if the pathway exists. Relevant pathways were evaluated and applicable criteria were identified based on Part 201 Nonresidential Cleanup Criteria and the MDEQ Administrative Rules. The following tables present the applicable criteria and exposure scenarios for the soil and groundwater contamination at the site.

#### Soil

The following potential soil exposure pathways were determined to be relevant:

- Nonresidential DWP Criteria;
- Nonresidential SVIA Inhalation Criteria;
- Nonresidential VSIC; and
- Nonresidential DC Criteria.

The potential soil exposure scenarios presented above were evaluated. The following table represents complete exposure pathways since the cleanup criteria were exceeded and receptors were identified.

Exposure Pathway	Criteria Exceeded	Exposure Pathway Potentially Present	Complete Exposure Pathway	Reason
NRDWP	Yes	Yes	Yes	Criteria exceeded. Shallow aquifer is considered potable.
NRSVIAI	Yes	Yes	Yes	Criteria exceeded. Site is surrounded by commercial buildings and residences that are inhabited.
NRVSIC	Yes	Yes	Yes	Criteria exceeded and source areas are currently on site. Site is surrounded by commercial buildings and residences that are inhabited.
NRDC	Yes	Yes	Yes	Criteria exceeded and contamination is found near surface. Receptor could potentially be a utility worker.

Groundwater

The following potential groundwater exposure pathways were determined to be relevant:

- Nonresidential DW Criteria; and
- Nonresidential Groundwater Volatilization to Indoor Air (GWVIA) Criteria.

The potential groundwater exposure scenarios presented above were evaluated. The following table represents complete exposure pathways since the cleanup criteria were exceeded and receptors were identified.

Exposure Pathway	Criteria Exceeded	Exposure Pathway Potentially Present	Complete Exposure Pathway	Reason
NRDW	Yes	Yes	Yes	Criteria exceeded and shallow aquifer is considered potable.

**5.0 CONCLUSIONS**

The following conclusions have been derived from the data collected during the limited remedial investigative activities conducted in June 2012 and September 2013:

1. The subsurface soil type is clayey sand to approximately 5 ft bsg followed by fine to coarse grain sand with fine to medium gravel to a depth of at least 25 ft bsg.
2. The depth to groundwater is approximately 20 ft bsg with the exception of April 2013 when it was 17.5 ft bsg. This is an indication of seasonal fluctuation.

3. The groundwater flow direction was to the west-northwest with an average horizontal hydraulic gradient of 0.0043 ft/ft in June 2010.
4. The vertical hydraulic gradients between the shallow (S), intermediate (I) and deep (D) well screen intervals was minimal at the MW-1 well group.
5. Soil samples collected at the Coldwater Chicago St. MGP property contained contaminant concentrations greater than the Nonresidential DWP, SVIAI, VSIC and DC Criteria.
6. Contaminant concentrations greater than Nonresidential DW Criteria were reported in the groundwater samples.
7. The exposure pathway analysis indicated that the relative exposure pathways that have the potential to become complete include soil leaching to groundwater, soil volatilization to indoor air, soil volatilization to ambient air, soil direct contact, and ingestion of contaminated groundwater.

## 6.0 RECOMMENDATION

The recommended treatment of the contaminated soil and groundwater at the Coldwater Chicago Street MGP site is soil removal followed with monitored natural attenuation of groundwater. The proposed corrective action must have the potential to reduce contamination at the site and was evaluated based on the following criteria:

- Technical feasibility and effectiveness;
- Cost opinion; and
- Time required for remediation.

In general, the scope of work will include the site activities set forth in the Remediation Work Plan submitted October 2, 2012. The MDEQ reviewed the work plan and approved with conditions per letter dated November 26, 2012. The Remediation Work Plan included the following site activities:

- Sheeting or shoring of the excavation perimeter in order to protect the integrity of the adjacent building(s);
- Perimeter ambient air monitoring;
- Relocation of buried utilities in excavation area;
- Soil excavation and disposal;
- Soil sample collection to verify extent of soil remediation; and
- Soil and groundwater disposal.

Permits will be obtained, as required. It is anticipated that the soil remediation will be scheduled during 2014.

**REPORT PREPARED ON APRIL 30, 2014 BY:  
PESCADOR, LLC**



Maureen Allen, CPG  
Project Manager

## Figures

Figure 1: Site Location Map

Figure 2: Site Sketch

Figure 3: Historical Sanborn Map (1922)

Figure 4: Groundwater Flow Diagram (June 2010)

Figure 5: Analytes Exceeding One or More Applicable Criteria – Surface Soil Samples

Figure 6: Analytes Exceeding One or More Applicable Criteria – Subsurface Soil Samples

Figure 7: Analytes Exceeding One or More Applicable Criteria – Groundwater Samples

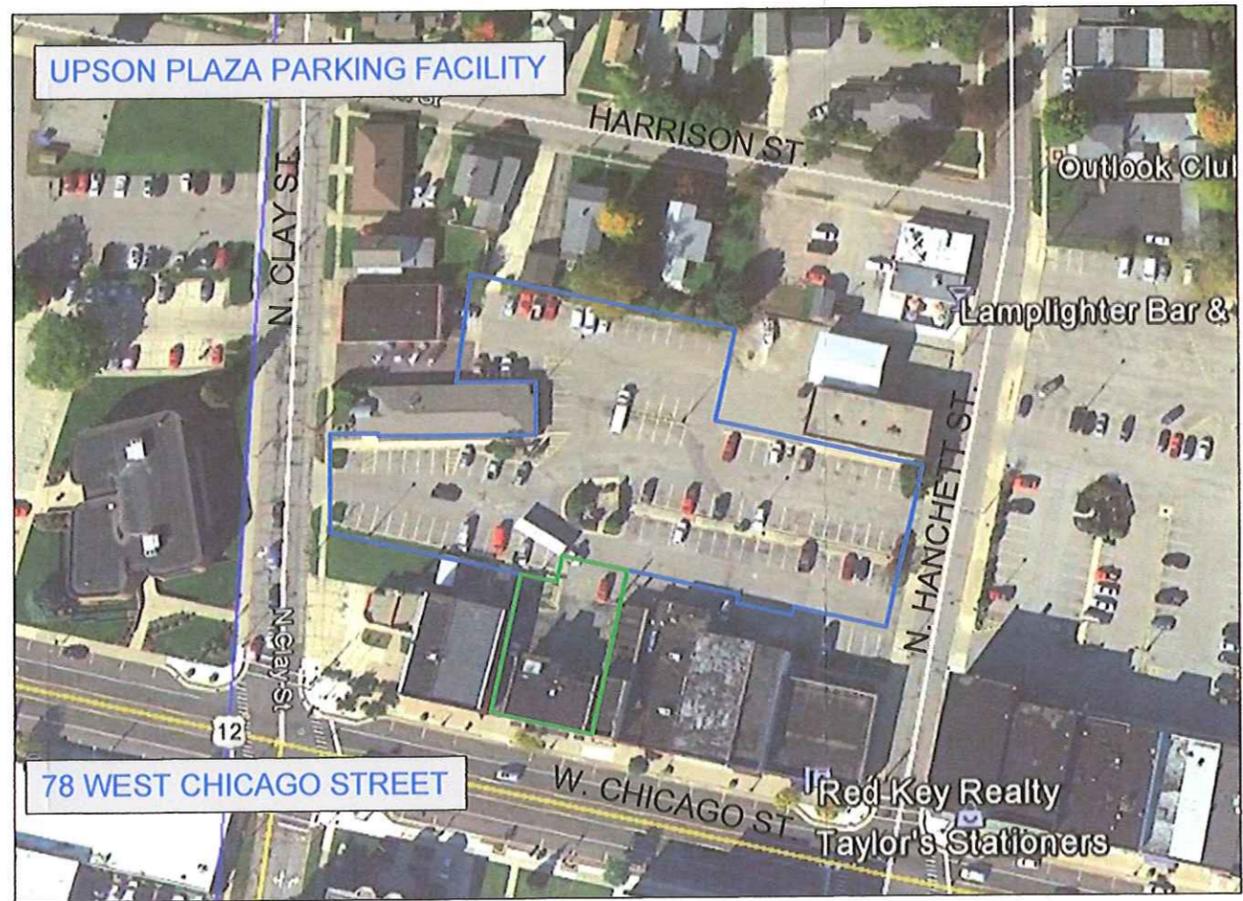
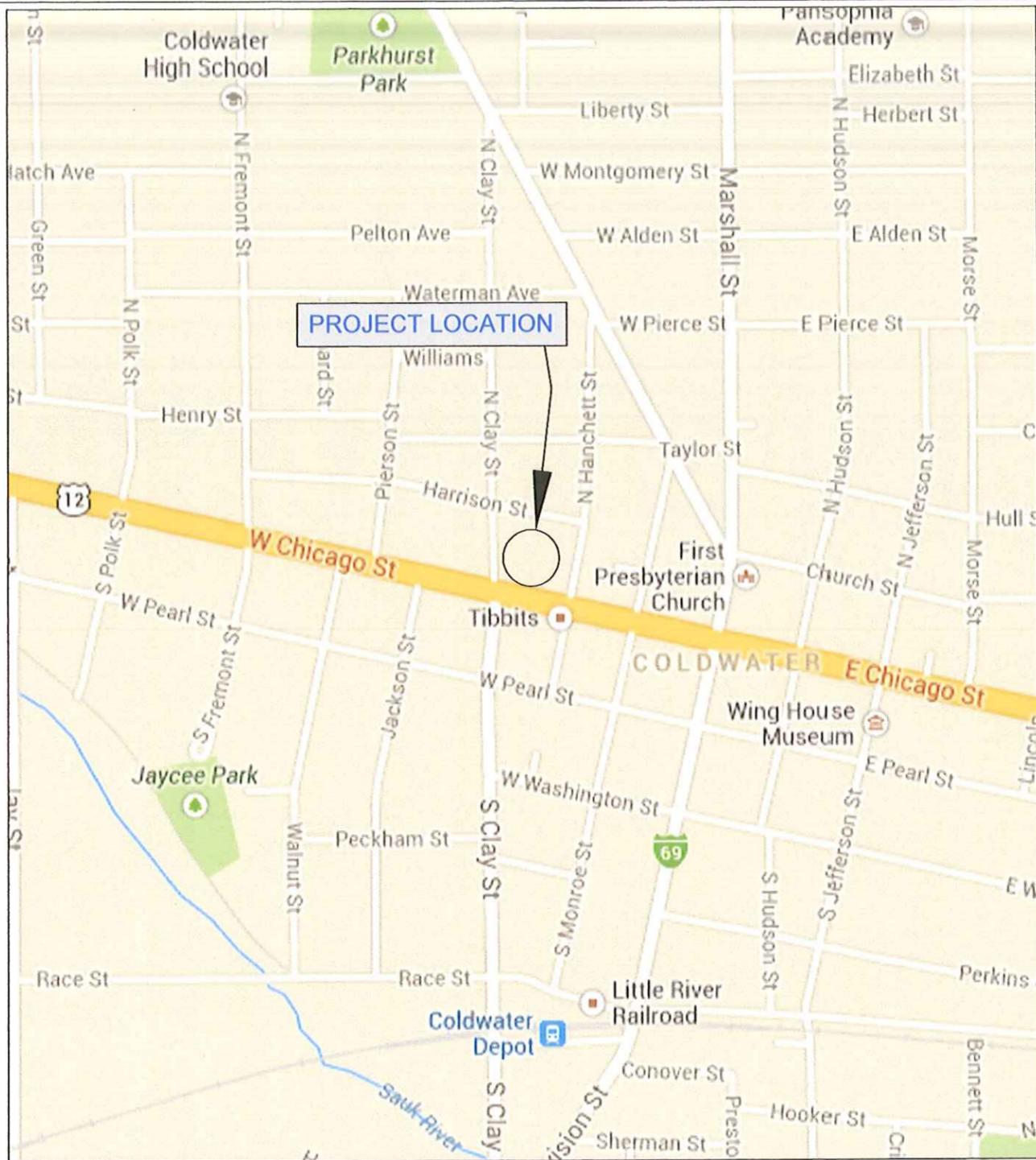


Figure 1

**SITE LOCATION MAP**  
 Michigan Gas Utilities—  
 Former Coldwater Chicago Street MGP Facility  
 West Chicago Street  
 Coldwater, Branch County, Michigan

	P.O. Box 5947 Traverse City, Michigan
	Project: Coldwater—Chicago St.    File: 2014/755_Site Location Map

- LEGEND**
- UPSON PLAZA PARKING FACILITY
  - 78 WEST CHICAGO STREET PROPERTY
  - SOIL BORING LOCATIONS—JUNE 2010
  - SOIL BORING LOCATIONS—AUGUST 2011
  - SOIL BORING LOCATIONS—JUNE 2012
  - SOIL BORING LOCATIONS—SEPTEMBER 2013
  - ⊕ MONITORING WELL LOCATIONS—JUNE 2012
  - GASHOLDER

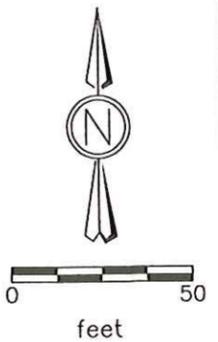
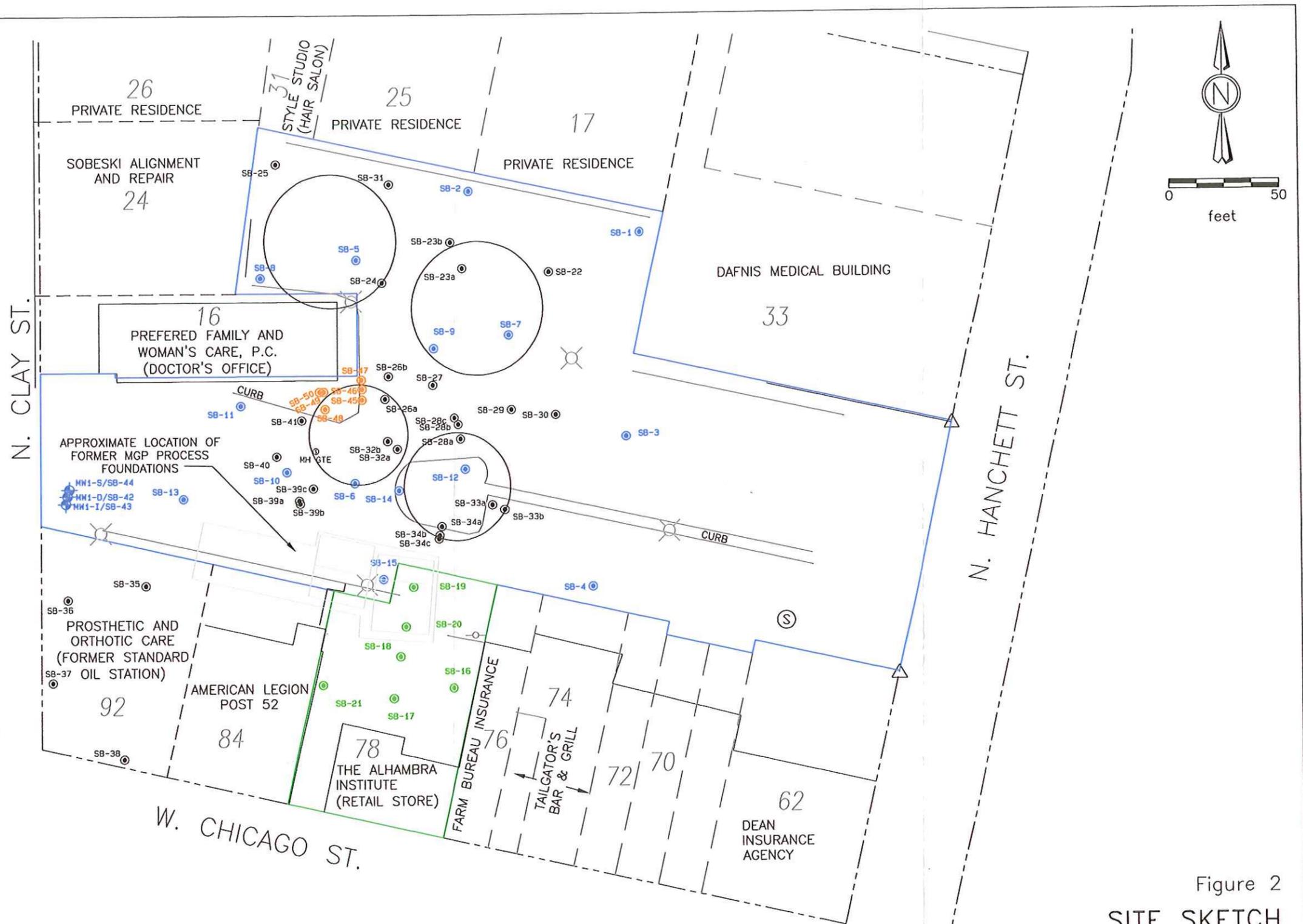


Figure 2  
**SITE SKETCH**  
 Michigan Gas Utilities—  
 Former Coldwater Chicago Street MGP Facility  
 West Chicago Street  
 Coldwater, Branch County, Michigan

	P.O. Box 5947 Traverse City, Michigan
	Project: Coldwater—Chicago St.      File: 2014/Site Sketch

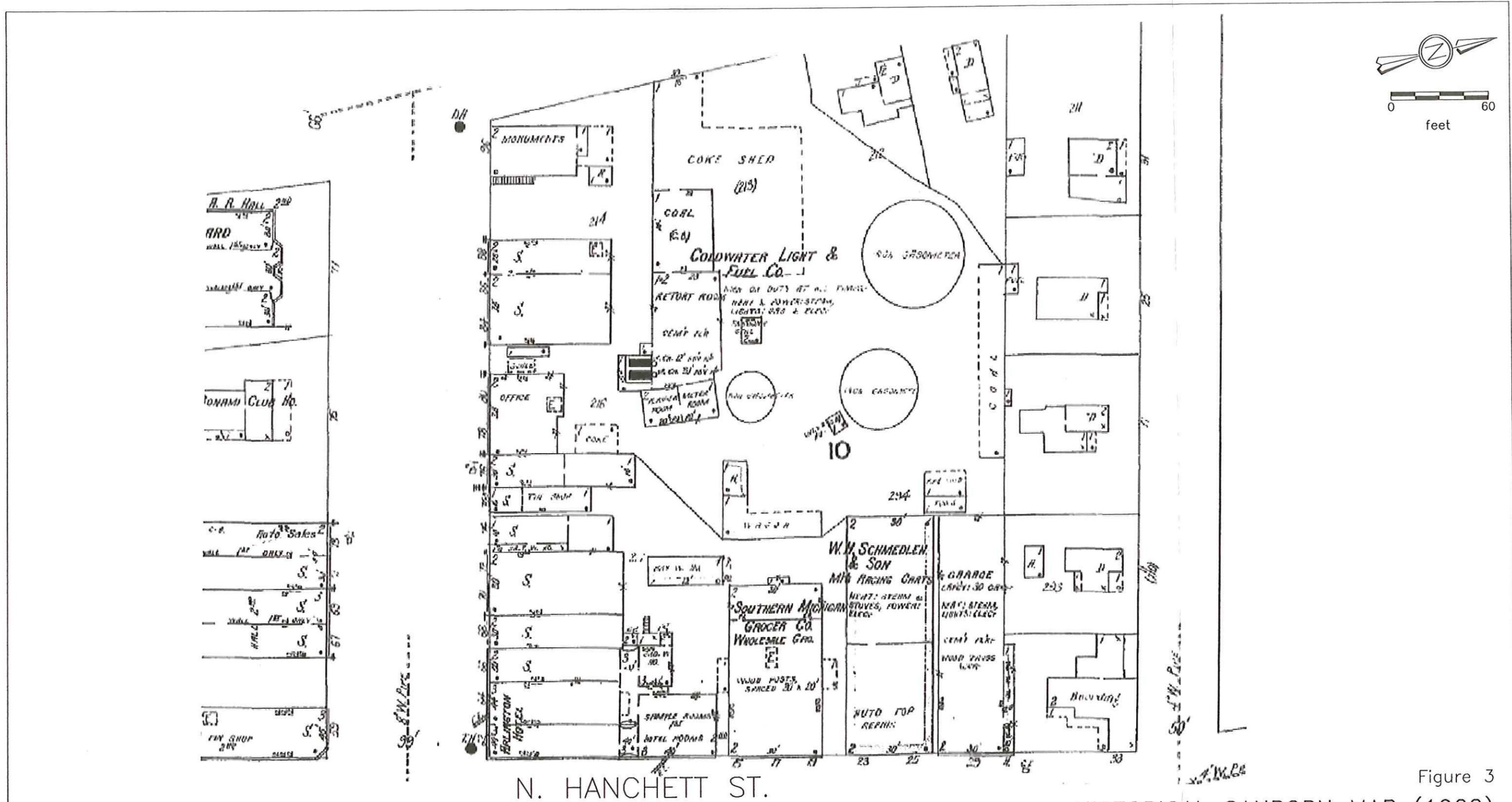
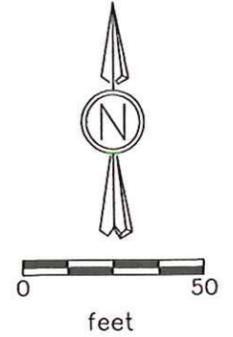
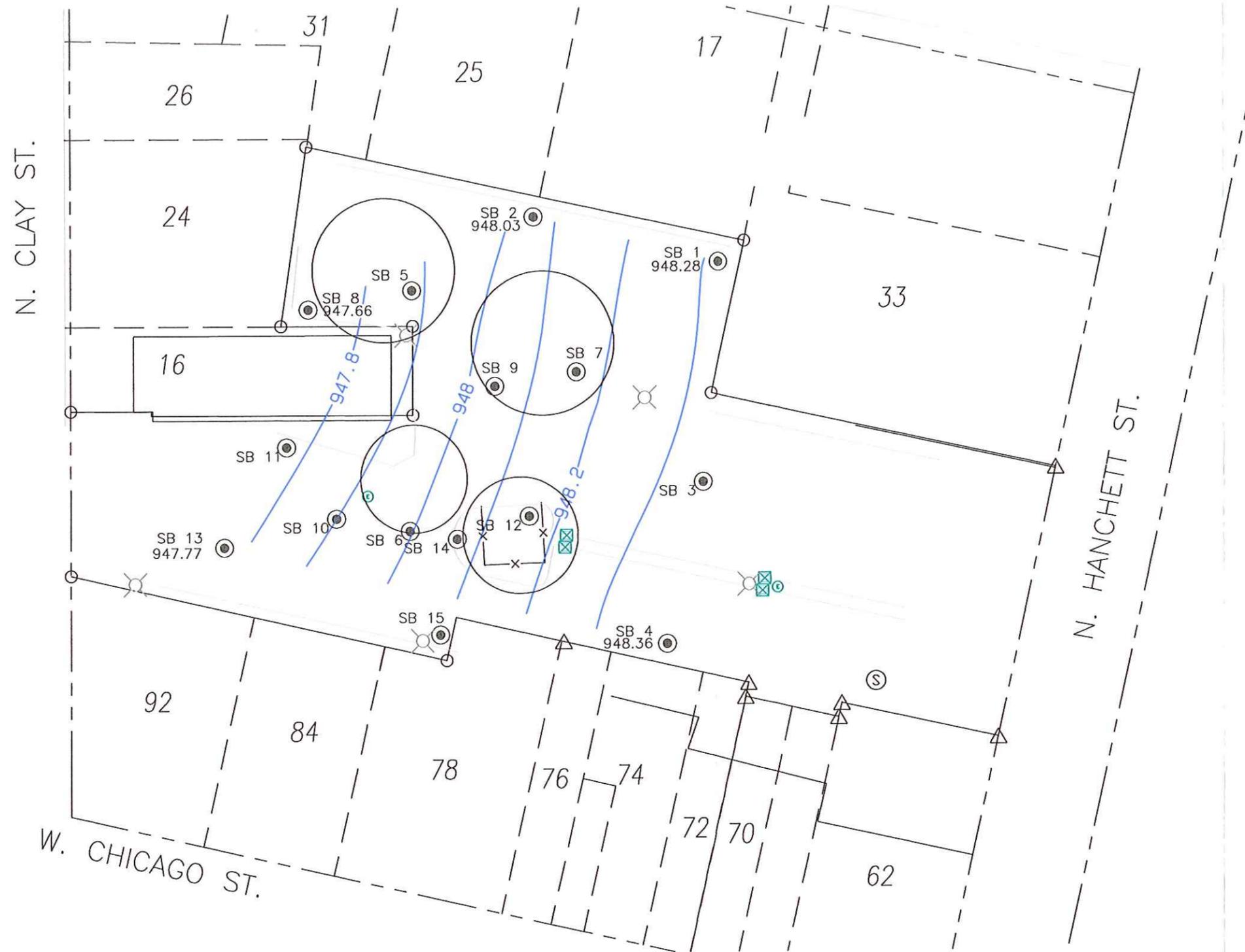


Figure 3  
 HISTORICAL SANBORN MAP (1922)  
 Michigan Gas Utilities—  
 Former Coldwater Chicago Street MGP Facility  
 West Chicago Street  
 Coldwater, Branch County, Michigan



- LEGEND**
- ⊙ SANITARY MANHOLE
  - ⊕ ELECTRICAL MANHOLE
  - ⊠ CATCH BASIN (CURB)
  - ⊗ UNDERGROUND GAS MARKER
  - ⊗ LIGHT/LAMP POST
  - ⊕ MONITORING WELL
  - ⊙ SOIL BORING/GEOPROBE
  - GROUNDWATER CONTOUR
  - 948.36 GROUNDWATER ELEVATION
  - CONC. CONCRETE
  - R/W RIGHT-OF-WAY
  - BOUNDARY LINE

Figure 4  
 GROUNDWATER FLOW DIAGRAM – JUNE 2010  
 Michigan Gas Utilities–Coldwater MGP  
 Chicago Street  
 Coldwater, Michigan

 <b>Pescador, LLC</b>	P.O. BOX 5947 Traverse City, Michigan
	Project: Coldwater–Chicago St. File: 2014/755_GWF_June 2010

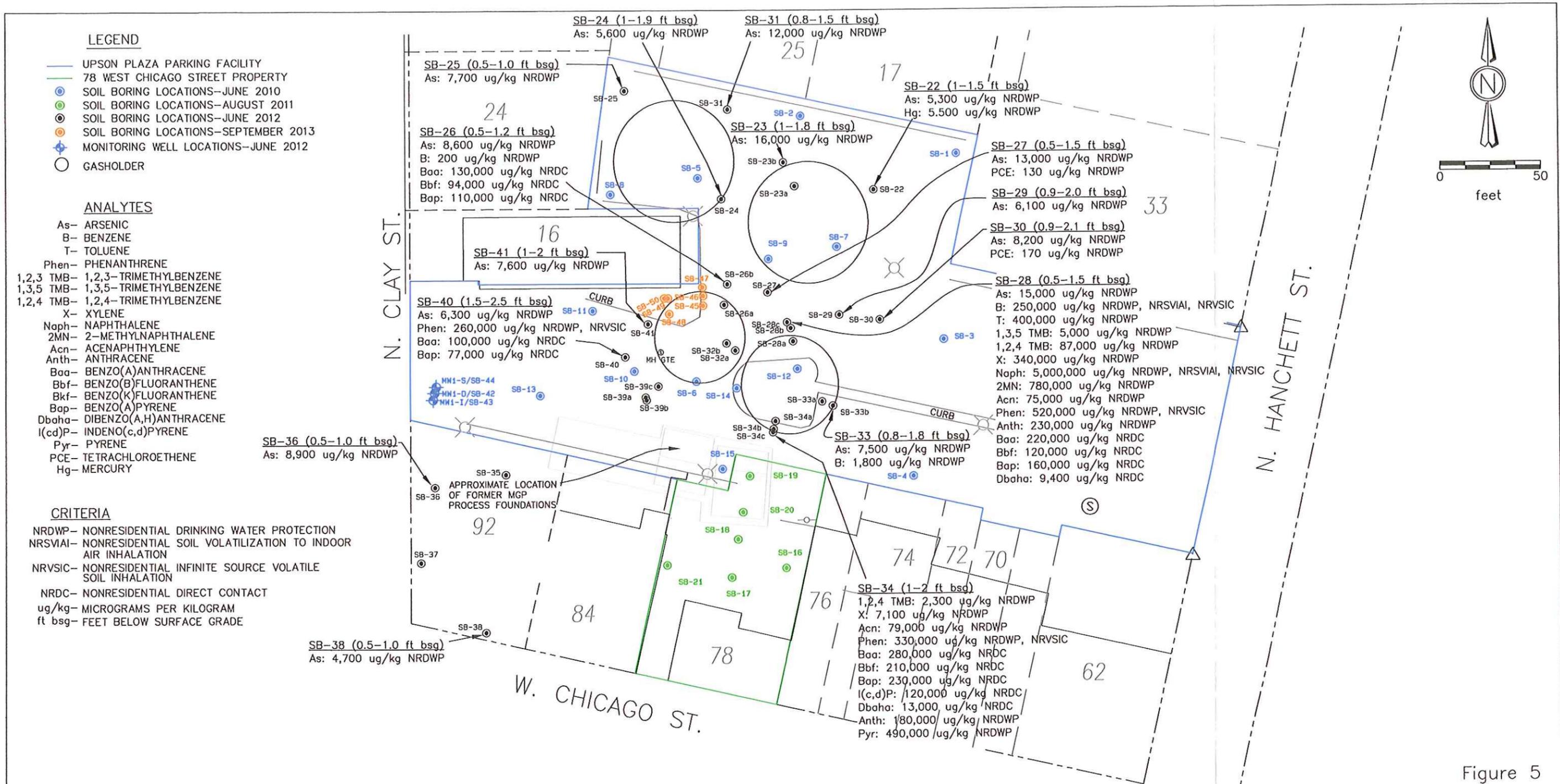


Figure 5  
 ANALYTES EXCEEDING ONE OR MORE APPLICABLE CRITERIA—  
 SURFACE SOIL SAMPLES  
 Michigan Gas Utilities—  
 Former Coldwater Chicago Street MGP Facility  
 West Chicago Street  
 Coldwater, Branch County, Michigan

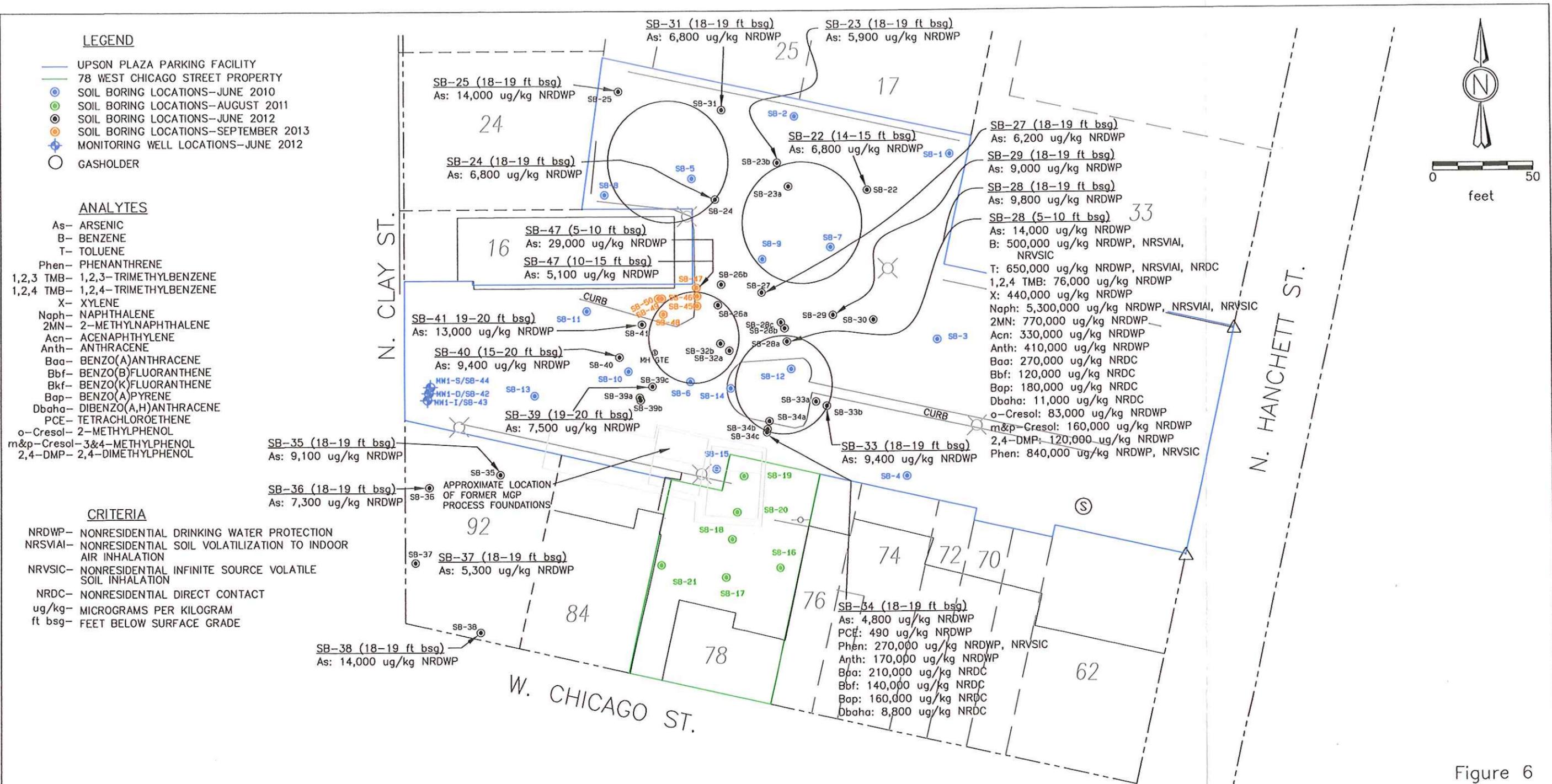


Figure 6  
 ANALYTES EXCEEDING ONE OR MORE APPLICABLE CRITERIA—  
 SUBSURFACE SOIL SAMPLES  
 Michigan Gas Utilities—  
 Former Coldwater Chicago Street MGP Facility  
 West Chicago Street  
 Coldwater, Branch County, Michigan

- LEGEND**
- UPSON PLAZA PARKING FACILITY
  - 78 WEST CHICAGO STREET PROPERTY
  - SOIL BORING LOCATIONS—JUNE 2010
  - SOIL BORING LOCATIONS—AUGUST 2011
  - SOIL BORING LOCATIONS—JUNE 2012
  - SOIL BORING LOCATIONS—SEPTEMBER 2013
  - ⊕ MONITORING WELL LOCATIONS—JUNE 2012
  - GASHOLDER
- As— ARSENIC  
 Pb— LEAD  
 PCE— TETRACHLOROETHENE  
 NRDWC— NONRESIDENTIAL DRINKING WATER CRITERIA  
 ug/l— MICROGRAMS PER LITER  
 ft bsg— FEET BELOW SURFACE GRADE

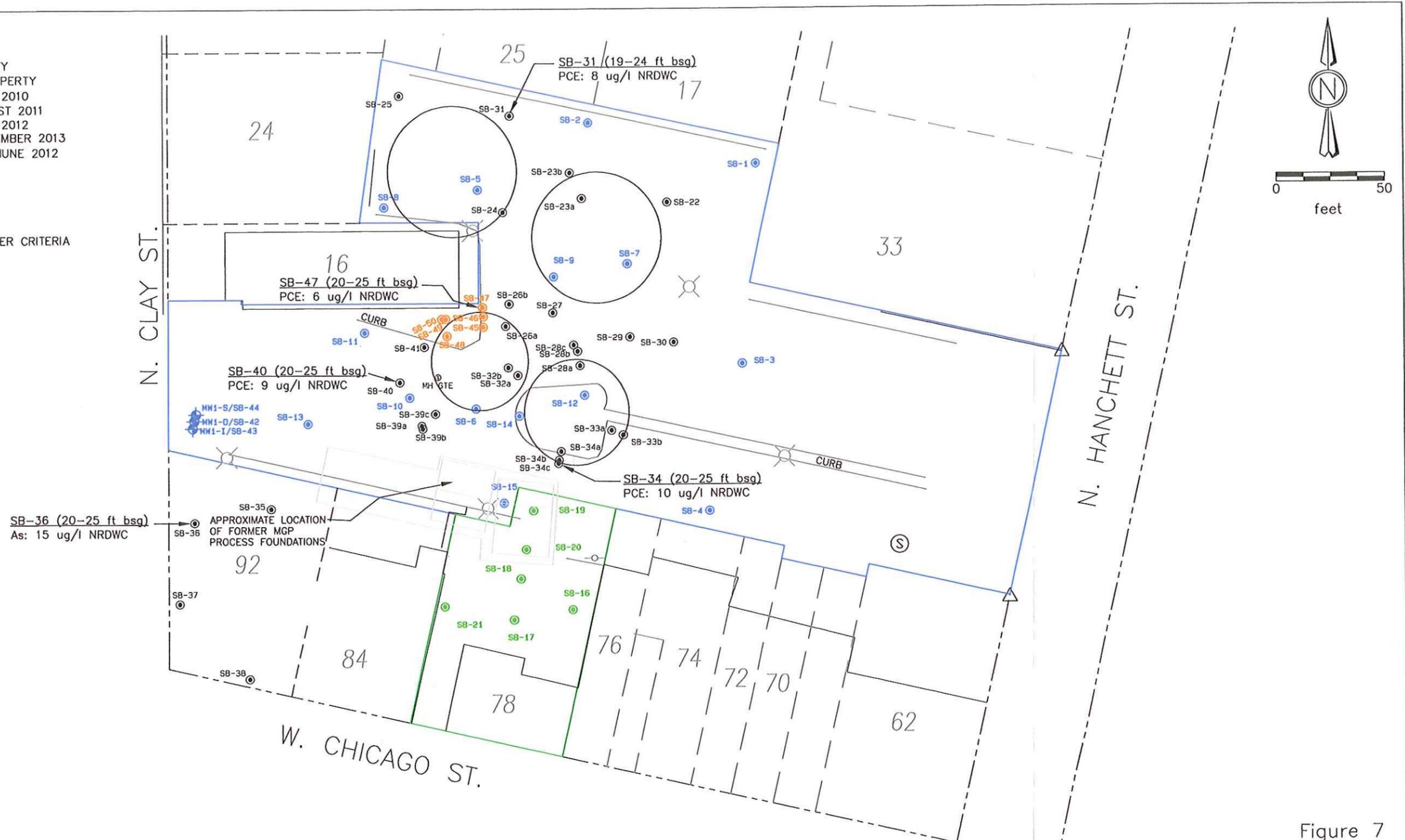


Figure 7  
 ANALYTES EXCEEDING ONE OR MORE APPLICABLE CRITERIA—  
 GROUNDWATER SAMPLES  
 Michigan Gas Utilities—  
 Former Coldwater Chicago Street MGP Facility  
 West Chicago Street  
 Coldwater, Branch County, Michigan

	P.O. Box 5947 Traverse City, Michigan
	Project: Coldwater—Chicago St.      File: 2014/755—GW_Ex

## **Tables**

**Table 1: Sample Depths and Analytical Parameters**

**Table 2: Survey Data and Groundwater Elevations**

**Table 3: Analytes Exceeding One or More Applicable Criteria –  
Surface Soil Samples**

**Table 4: Analytes Exceeding One or More Applicable Criteria –  
Subsurface Soil Samples**

**Table 5: Analytes Exceeding One or More Applicable Criteria –  
Soil Boring Groundwater Samples**

**Table 6: Analytes Exceeding One or More Applicable Criteria –  
Monitoring Well Groundwater Samples**

**TABLE 1**

**Sampling Locations and Analytical Parameters**  
**Remedial Investigation III**  
**Michigan Gas Utilities - Former Coldwater Chicago Street MGP**

Surface Soil Samples						
Sampling Location	Depth (ft bsg)	Laboratory Analysis				
		VOCs	PNAs/Phenols	Metals	Available Cyanide	Ammonia
SB-22	1 - 1.5	X	X	X	X	
SB-23	1 - 1.8	X	X	X	X	
SB-24	1 - 1.9	X	X	X	X	
SB-25	0.5 - 1	X	X	X		
SB-26	0.5 - 1.2	X	X	X	X	
SB-27	0.5 - 1.5	X	X	X	X	
SB-28	0.5 - 1.5	X	X	X	X	
SB-29	0.9 - 2	X	X	X	X	
SB-30	0.9 - 2.1	X	X	X	X	
SB-31	0.8 - 1.5	X	X	X	X	
SB-33	0.8 - 1.8	X	X	X	X	
SB-34	1 - 2	X	X	X	X	
SB-36	0.5 - 1	X	X	X	X	
SB-38	0.5 - 1	X	X	X	X	
SB-40	1.5 - 2.5	X	X	X		X
SB-41	1 - 2	X	X	X	X	X

Subsurface Soil Samples						
Sampling Location	Depth (ft bsg)	Laboratory Analysis				
		VOCs	PNAs/Phenols	Metals	Available Cyanide	Ammonia
SB-22	14 - 15	X	X	X	X	
SB-23	18 - 19	X	X	X	X	
SB-24	18 - 19	X	X	X	X	
SB-25	18 - 19	X	X	X	X	
SB-26	18 - 19	X	X	X	X	
SB-27	18 - 19	X	X	X	X	
SB-28	5 - 10	X	X	X	X	
SB-28	18 - 19	X	X	X	X	
SB-29	18 - 19	X	X	X	X	
SB-30	18 - 19	X	X	X	X	
SB-31	18 - 19	X	X	X	X	
SB-33	18 - 19	X	X	X	X	
SB-34	18 - 19	X	X	X	X	
SB-35	18 - 19	X	X	X	X	
SB-36	18 - 19	X	X	X	X	
SB-37	18 - 19	X	X	X	X	
SB-38	18 - 19	X	X	X	X	
SB-39	19 - 20	X	X	X	X	X
SB-40	15 - 20	X	X	X		X
SB-41	19 - 20	X	X	X	X	X
SB-47	5 - 10	X	X	X	X	X
SB-47	10 - 15	X	X	X	X	X
SB-47	15 - 20	X	X	X	X	X

Groundwater Samples							
Sampling Location	Depth (ft bsg)	Laboratory Analysis					Total Cyanide and Sulfide
		VOCs	PNAs/Phenols	Metals	Available Cyanide	Ammonia	
SB-30	19 - 24	X	X	X	X		
SB-31	19 - 24	X	X	X	X		
SB-34	20 - 25	X	X	X	X		
SB-36	20 - 25	X	X	X	X	X	
SB-38	20 - 25	X	X	X	X		
SB-40	20 - 25	X	X	X		X	
SB-47	20 - 25	X	X	X	X	X	
SB-42 / MW-1D	40 - 45	X	X	X	X	X	X
SB-43 / MW-1I	30 - 35	X	X	X	X	X	X
SB-44 / MW-1S	20 - 25	X	X	X	X	X	X

X Indicates sample was submitted for laboratory analysis  
 ft bsg feet below surface grade  
 VOCs Volatile organic compounds  
 PNAs Polynuclear aromatic hydrocarbons  
 Metals A select group of total metals including arsenic, barium, cadmium, chromium, copper, lead, mercury, selenium, silver, and zinc.

**TABLE 2**

**Survey Data and Groundwater Elevations  
 Remedial Investigation II  
 Michigan Gas Utilities - Former Coldwater Chicago Street MGF**

**SOIL BORINGS**

Sample Location	Measurement Date	Easting Coordinate	Northing Coordinate	Ground Elevation (feet above mean sea level)	Sample Location	Measurement Date	Easting Coordinate	Northing Coordinate	Ground Elevation (feet above mean sea level)
SB-22	6/21/2012	12949883.89	161763.56	966.71	SB-32A	6/21/2012	12949814.57	161684.71	966.76
SB-23A	6/21/2012	12949844.35	161765.44	966.53	SB-32B	6/21/2012	12949810.21	161688.23	966.73
SB-23B	6/21/2012	12949838.77	161777.18	966.37	SB-33A	6/21/2012	12949858.00	161659.38	966.41
SB-24	6/21/2012	12949807.77	161759.23	966.48	SB-33B	6/21/2012	12949863.35	161657.30	966.49
SB-25	6/21/2012	12949759.67	161812.53	966.43	SB-34B	6/21/2012	12949833.59	161645.88	967.10
SB-26A	6/21/2012	12949809.01	161707.16	966.79	SB-34C	6/21/2012	12949833.24	161644.35	967.12
SB-26B	6/21/2012	12949810.62	161717.29	967.00	SB-35	6/21/2012	12949700.10	161623.91	967.58
SB-27	6/21/2012	12949830.69	161713.23	966.93	SB-36	6/21/2012	12949664.71	161617.67	966.59
SB-28A	6/21/2012	12949843.40	161689.08	966.65	SB-37	6/21/2012	12949657.77	161580.63	966.55
SB-28B	6/21/2012	12949842.28	161695.60	966.70	SB-38	6/21/2012	12949690.10	161546.22	966.47
SB-28C	6/21/2012	12949840.44	161698.50	966.77	SB-39A	6/21/2012	12949769.98	161661.69	967.63
SB-29	6/21/2012	12949866.49	161702.04	966.72	SB-39B	6/21/2012	12949770.44	161660.34	967.70
SB-30	6/21/2012	12949886.73	161699.59	966.78	SB-39C	6/21/2012	12949776.24	161667.16	967.51
SB-31	6/21/2012	12949811.10	161803.27	966.15	SB-40	6/21/2012	12949759.79	161681.60	967.62
					SB-41	6/21/2012	12949771.20	161697.67	967.30

**MONITORING WELLS**

Sample Location	Measurement Date	Easting Coordinate	Northing Coordinate	Top-of-Casing Elevation (TOC)	Ground Elevation (feet above mean sea level)	Total Depth (feet below TOC)	Screened Interval (feet)	Static Water Level (feet below TOC)	Groundwater Elevation (feet above mean sea level)
MW-1S	6/21/2012	12949665.48	161667.28	966.12	966.59	24.97	20-25	19.88	946.24
MW-1S	10/15/2012	12949665.48	161667.28	966.12	966.59	24.97	20-25	20.67	945.45
MW-1S	4/24/2013	12949665.48	161667.28	966.12	966.59	24.97	20-25	17.60	948.52
MW-1S	9/23/2013	12949665.48	161667.28	966.12	966.59	24.97	20-25	19.81	946.31
MW-1I	6/21/2012	12949663.91	161660.88	966.13	966.48	34.14	30-35	19.90	946.23
MW-1I	10/15/2012	12949663.91	161660.88	966.13	966.48	34.14	30-35	20.67	945.46
MW-1I	4/24/2013	12949663.91	161660.88	966.13	966.48	34.14	30-35	17.60	948.53
MW-1I	9/23/2013	12949663.91	161660.88	966.13	966.48	34.14	30-35	19.83	946.30
MW-1D	6/21/2012	12949664.67	161664.31	966.25	966.58	44.51	40-45	20.00	946.25
MW-1D	10/15/2012	12949664.67	161664.31	966.25	966.58	44.51	40-45	20.80	945.45
MW-1D	4/24/2013	12949664.67	161664.31	966.25	966.58	44.51	40-45	17.72	948.53
MW-1D	9/23/2013	12949664.67	161664.31	966.25	966.58	44.51	40-45	19.93	946.32

TABLE 3

Analytes Exceeding One or More Applicable Cleanup Criteria - Surface Soil Samples  
Remedial Investigation III  
Michigan Gas Utilities - Former Coldwater Chicago Street MGP

Sample Number	Depth (ft bsg)	Date Sampled	Analyte	Concentration (ug/kg)	Nonresidential Cleanup Criteria			
					Drinking Water Protection Criteria	Soil Volatilization to Indoor Air Inhalation Criteria	Infinite Source Volatile Soil Inhalation Criteria	Direct Contact Criteria
SB-22	1 - 1.5	6/11/2012	Total Arsenic	5,300	4,600	NLV	NLV	37,000
			Total Mercury	5,500	1,700	89,000	62,000	580,000
SB-23	1 - 1.8	6/11/2012	Total Arsenic	16,000	4,600	NLV	NLV	37,000
SB-24	1 - 1.9	6/11/2012	Total Arsenic	5,600	4,600	NLV	NLV	37,000
SB-25	0.5 - 1	6/11/2012	Total Arsenic	7,700	4,600	NLV	NLV	37,000
SB-26	0.5 - 1.2	6/11/2012	Total Arsenic	8,600	4,600	NLV	NLV	37,000
			Benzene	200	100	8,400	45,000	840,000 (C)
			Benzo(a)anthracene	130,000	NLL	NLV	NLV	80,000
			Benzo(b)fluoranthene	94,000	NLL	ID	ID	80,000
			Benzo(a)pyrene	110,000	NLL	NLV	NLV	8,000
SB-27	0.5 - 1.5	6/11/2012	Total Arsenic	13,000	4,600	NLV	NLV	37,000
			Tetrachloroethene	130	100	21,000	210,000	930,000 (C)
SB-28	0.5 - 1.5	6/11/2012	Total Arsenic	15,000	4,600	NLV	NLV	37,000
			Benzene	250,000	100	8,400	45,000	840,000 (C)
			2-Methylnaphthalene	780,000	170,000	4,900,000	1,800,000	26,000,000
			Naphthalene	5,000,000	100,000	470,000	350,000	52,000,000
			Toluene	400,000	16,000	610,000 (C)	3,300,000	160,000,000 (C)
			1,2,4-Trimethylbenzene	87,000	2,100	8,000,000 (C)	25,000,000	100,000,000 (C)
			1,3,5-Trimethylbenzene	5,000	1,800	4,800,000 (C)	94,000	100,000,000 (C)
			Xylenes	340,000	5,600	150,000	54,000,000	1,000,000,000 (C,D)
			Acenaphthylene	75,000	17,000	3,000,000	2,700,000	5,200,000
			Anthracene	230,000	41,000	1,000,000,000 (D)	1,600,000,000	730,000,000
			Benzo(a)anthracene	220,000	NLL	NLV	NLV	80,000
			Benzo(b)fluoranthene	120,000	NLL	ID	ID	80,000
			Benzo(a)pyrene	160,000	NLL	NLV	NLV	8,000
			Dibenzo(a,h)anthracene	9,400	NLL	NLV	NLV	8,000
Phenanthrene	520,000	160,000	5,100,000	190,000	5,200,000			

Results reported in micrograms per kilogram (ug/kg)

- ft bsg feet below surface grade
- NA Not available
- ID Insufficient data to develop criterion
- NLL Not likely to leach
- NLV Not likely to volatilize

Reported concentration exceeds indicated cleanup criteria

Cleanup criteria from Attachment 1, Table 3, Part 201 Generic Cleanup Criteria and Screening Levels, December 30, 2013.

Refer to Appendix B for additional Part 201 Criteria Footnote definitions.

TABLE 3

Analytes Exceeding One or More Applicable Cleanup Criteria - Surface Soil Samples  
Remedial Investigation III  
Michigan Gas Utilities - Former Coldwater Chicago Street MGP

Sample Number	Depth (ft bsg)	Date Sampled	Analyte	Concentration (ug/kg)	Nonresidential Cleanup Criteria			
					Drinking Water Protection Criteria	Soil Volatilization to Indoor Air Inhalation Criteria	Infinite Source Volatile Soil Inhalation Criteria	Direct Contact Criteria
SB-29	0.9 - 2	6/12/2012	Total Arsenic	6,100	4,600	NLV	NLV	37,000
SB-30	0.9 - 2.1	6/12/2012	Total Arsenic	8,200	4,600	NLV	NLV	37,000
			Tetrachloroethene	170	100	21,000	210,000	930,000 (C)
SB-31	0.8 - 1.5	6/12/2012	Total Arsenic	12,000	4,600	NLV	NLV	37,000
SB-33	0.8 - 1.8	6/12/2012	Total Arsenic	7,500	4,600	NLV	NLV	37,000
			Benzene	1,800	100	8,400	45,000	840,000 (C)
SB-34	1 - 2	6/12/2012	1,2,4-Trimethylbenzene	2,300	2,100	8,000,000 (C)	25,000,000	100,000,000 (C)
			Xylenes	7,100	5,600	150,000	54,000,000	1,000,000,000 (C,D)
			Acenaphthylene	79,000	17,000	3,000,000	2,700,000	5,200,000
			Benzo(a)anthracene	280,000	NLL	ID	ID	80,000
			Benzo(b)fluoranthene	210,000	NLL	ID	ID	80,000
			Benzo(a)pyrene	230,000	NLL	NLV	NLV	8,000
			Dibenzo(a,h)anthracene	13,000	NLL	NLV	NLV	8,000
			Indeno(1,2,3-cd)pyrene	120,000	NLL	NLV	NLV	80,000
			Phenanthrene	330,000	160,000	5,100,000	190,000	5,200,000
			Pyrene	490,000	480,000	1,000,000,000 (D)	780,000,000	84,000,000
SB-36	0.5 - 1	6/12/2012	Total Arsenic	8,900	4,600	NLV	NLV	37,000
SB-38	0.5 - 1	6/12/2012	Total Arsenic	4,700	4,600	NLV	NLV	37,000
SB-40	1.5 - 2.5	6/13/2012	Total Arsenic	6,300	4,600	NLV	NLV	37,000
			Benzo(a)anthracene	100,000	NLL	NLV	NLV	80,000
			Benzo(a)pyrene	77,000	NLL	NLV	NLV	8,000
			Indeno(1,2,3-cd)pyrene	37,000	NLL	NLV	NLV	80,000
			Phenanthrene	260,000	160,000	5,100,000	190,000	5,200,000
SB-41	1 - 2	6/13/2012	Total Arsenic	7,600	4,600	NLV	NLV	37,000

Results reported in micrograms per kilogram (ug/kg)

- ft bsg feet below surface grade
- NA Not available
- ID Insufficient data to develop criterion
- NLL Not likely to leach
- NLV Not likely to volatilize

Reported concentration exceeds indicated cleanup criteria

Cleanup criteria from Attachment 1, Table 3, Part 201 Generic Cleanup Criteria and Screening Levels, December 30, 2013.

Refer to Appendix B for additional Part 201 Criteria Footnote definitions.

TABLE 4

Analytes Exceeding One or More Applicable Cleanup Criteria - Subsurface Soil Samples  
Remedial Investigation III  
Michigan Gas Utilities - Former Coldwater Chicago Street MGP

Sample Number	Depth (ft bsg)	Date Sampled	Analyte	Concentration (ug/kg)	Nonresidential Cleanup Criteria			
					Drinking Water Protection Criteria #21	Soil Volatilization to Indoor Air Inhalation Criteria #22	Infinite Source Volatile Soil Inhalation Criteria #23	Direct Contact Criteria #27
SB-22	14 - 15	6/11/2012	Total Arsenic	6,800	4,600	NLV	NLV	37,000
SB-23	18 - 19	6/11/2012	Total Arsenic	5,900	4,600	NLV	NLV	37,000
SB-24	18 - 19	6/11/2012	Total Arsenic	6,800	4,600	NLV	NLV	37,000
SB-25	18 - 19	6/11/2012	Total Arsenic	14,000	4,600	NLV	NLV	37,000
SB-27	18 - 19	6/11/2012	Total Arsenic	6,200	4,600	NLV	NLV	37,000
SB-28	5 - 10	6/11/2012	Total Arsenic	14,000	4,600	NLV	NLV	37,000
			Benzene	500,000	100	8,400	45,000	840,000 (C)
			2-Methylnaphthalene	770,000	170,000	4,900,000	1,800,000	26,000,000
			Naphthalene	5,300,000	100,000	470,000	350,000	52,000,000
			Toluene	650,000	16,000	610,000 (C)	3,300,000	160,000,000 (C)
			1,2,4-Trimethylbenzene	76,000	2,100	110,000	25,000,000	100,000,000 (C)
			Xylenes	440,000	5,600	150,000	54,000,000	1,000,000,000 (C,D)
			Acenaphthylene	330,000	17,000	3,000,000	2,700,000	5,200,000
			Anthracene	410,000	41,000	1,000,000,000 (D)	1,600,000,000	730,000,000
			Benzo(a)anthracene	270,000	NLL	NLV	NLV	80,000
			Benzo(b)fluoranthene	120,000	NLL	ID	ID	80,000
			Benzo(a)pyrene	180,000	NLL	NLV	NLV	8,000
			Dibenzo(a,h)anthracene	11,000	NLL	NLV	NLV	8,000
			2-Methylnaphthalene	530,000	170,000	4,900,000	1,800,000	26,000,000
			Naphthalene	1,900,000	100,000	470,000	350,000	52,000,000
			Phenanthrene	840,000	160,000	5,100,000	190,000	5,200,000
			2,4-Dimethylphenol	120,000	20,000	NLV	NLV	36,000,000
		(m&p-cresol)	3&4-Methylphenol	160,000	20,000	NLV	NLV	36,000,000
		(o-cresol)	2-Methylphenol	83,000	20,000	NLV	NLV	36,000,000

Results reported in micrograms per kilogram (ug/kg)

ft bsg feet below surface grade

NA Not available

ID Insufficient data to develop criterion

NLL Not likely to leach

NLV Not likely to volatilize

Reported concentration exceeds indicated cleanup criteria

Cleanup criteria from Attachment 1, Table 3, Part 201 Generic Cleanup Criteria and Screening Levels, December 30, 2013.

Refer to Appendix B for additional Part 201 Criteria Footnote definitions.

TABLE 4

Analytes Exceeding One or More Applicable Cleanup Criteria - Subsurface Soil Samples  
Remedial Investigation III  
Michigan Gas Utilities - Former Coldwater Chicago Street MGP

Sample Number	Depth (ft bsg)	Date Sampled	Analyte	Concentration (µg/kg)	Nonresidential Cleanup Criteria			
					Drinking Water Protection Criteria #21	Soil Volatilization to Indoor Air Inhalation Criteria #22	Infinite Source Volatile Soil Inhalation Criteria #23	Direct Contact Criteria #27
SB-28	18 - 19	6/11/2012	Total Arsenic	9,800	4,600	NLV	NLV	37,000
SB-29	18 - 19	6/12/2012	Total Arsenic	9,000	4,600	NLV	NLV	37,000
SB-31	18 - 19	6/12/2012	Total Arsenic	6,800	4,600	NLV	NLV	37,000
SB-33	18 - 19	6/12/2012	Total Arsenic	9,400	4,600	NLV	NLV	37,000
SB-34	18 - 19	6/12/2012	Total Arsenic	4,800	4,600	NLV	NLV	37,000
			Tetrachloroethene	490	100	21,000	210,000	930,000 (C)
			Anthracene	170,000	41,000	1,000,000,000 (D)	1,600,000,000	730,000,000
			Benzo(a)anthracene	210,000	NLL	NLV	NLV	80,000
			Benzo(b)fluoranthene	140,000	NLL	ID	ID	80,000
			Benzo(a)pyrene	160,000	NLL	NLV	NLV	8,000
			Dibenzo(a,h)anthracene	8,800	NLL	NLV	NLV	8,000
Phenanthrene	270,000	160,000	5,100,000	190,000	5,200,000			
SB-35	18 - 19	6/12/2012	Total Arsenic	9,100	4,600	NLV	NLV	37,000
SB-36	18 - 19	6/12/2012	Total Arsenic	7,300	4,600	NLV	NLV	37,000
SB-37	18 - 19	6/12/2012	Total Arsenic	5,300	4,600	NLV	NLV	37,000
SB-38	18 - 19	6/12/2012	Total Arsenic	14,000	4,600	NLV	NLV	37,000
SB-39	19 - 20	6/13/2012	Total Arsenic	7,500	4,600	NLV	NLV	37,000
SB-40	15 - 20	6/13/2012	Total Arsenic	9,400	4,600	NLV	NLV	37,000
SB-41	19 - 20	6/13/2012	Total Arsenic	13,000	4,600	NLV	NLV	37,000
SB-47	5 - 10	9/23/2013	Total Arsenic	29,000	4,600	NLV	NLV	37,000
SB-47	10 - 15	9/23/2013	Total Arsenic	5,100	4,600	NLV	NLV	37,000

Results reported in micrograms per kilogram (µg/kg)

ft bsg feet below surface grade

NA Not available

ID Insufficient data to develop criterion

NLL Not likely to leach

NLV Not likely to volatilize

Reported concentration exceeds indicated cleanup criteria

Cleanup criteria from Attachment 1, Table 3, Part 201 Generic Cleanup Criteria and Screening Levels, December 30, 2013.

Refer to Appendix B for additional Part 201 Criteria Footnote definitions.

**TABLE 5**

**Analytes Exceeding One or More Applicable Cleanup Criteria - Soil Boring Groundwater Samples**  
**Remedial Investigation III**  
**Michigan Gas Utilities - Former Coldwater Chicago Street MGP**

Sample Number	Depth (ft bsg)	Date Sampled	Analyte	Concentration (µg/l)	Nonresidential Cleanup Criteria	
					Drinking Water Criteria	Volatilization to Indoor Air Inhalation Criteria
SB-31	19 - 24	6/12/2012	Tetrachloroethene	8	5 (A)	170,000
SB-34	20 - 25	6/12/2012	Tetrachloroethene	10	5 (A)	170,000
SB-36	20 - 25	6/12/2012	Total Arsenic	15	10 (A)	NLV
SB-40	20 - 25	6/13/2012	Tetrachloroethene	9	5 (A)	170,000
SB-47	20 - 25	9/23/2013	Tetrachloroethene	6	5 (A)	170,000

Results reported in micrograms per liter (ug/l)

ft bsg feet below surface grade

NA Not available

NLV Not likely to volatilize

ID Insufficient data to develop criterion

  Reported concentration exceeds indicated cleanup criteria

Cleanup criteria from Attachment 1, Table 1, Part 201 Generic Cleanup Criteria and Screening Levels, December 30, 2013.

Refer to Appendix B for additional Part 201 Criteria Footnote definitions.

TABLE 6

Analytical Results Summary - Monitoring Well Groundwater Samples  
Remedial Investigation III  
Michigan Gas Utilities - Former Coldwater Chicago Street MGP

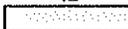
Well Number	Depth (ft bsg)	Date Sampled	Analyte	Concentration (µg/l)	Nonresidential Cleanup Criteria	
					Drinking Water Criteria	Volatilization to Indoor Air Inhalation Criteria
<b>METALS</b>						
MW-1S	20 - 25	6/21/2012	Not detected			
MW-1S	20 - 25	6/21/2012	Available Cyanide	Not detected		
			Total Cyanide	42	200 (A)	NLV
			Total Sulfide	Not detected		
MW-1S	20 - 25	6/21/2012	Ammonia	Not detected		
<b>VOCs</b>						
MW-1S	20 - 25	6/21/2012	Tetrachloroethene	2	5 (A)	170,000
<b>PNAs/PHENOLS</b>						
MW-1S	20 - 25	6/21/2012	Not detected			
<b>METALS</b>						
MW-1S	20 - 25	10/15/2012	Not detected			
MW-1S	20 - 25	10/15/2012	Available Cyanide	Not detected		
<b>VOCs</b>						
MW-1S	20 - 25	10/15/2012	Not detected			
<b>PNAs/PHENOLS</b>						
MW-1S	20 - 25	10/15/2012	Not detected			
<b>METALS</b>						
MW-1S	20 - 25	4/24/2013	Not detected			
MW-1S	20 - 25	4/24/2013	Available Cyanide	Not detected		
MW-1S	20 - 25	4/24/2013	Ammonia	40	10,000 (A)	7,100,000
<b>VOCs</b>						
MW-1S	20 - 25	4/24/2013	Not detected			
<b>PNAs/PHENOLS</b>						
MW-1S	20 - 25	4/24/2013	Not detected			
<b>METALS</b>						
MW-1S	20 - 25	9/23/2013	Total Barium	100	2,000 (A)	NLV
MW-1S	20 - 25	9/23/2013	Available Cyanide	2	200 (A)	NLV
MW-1S	20 - 25	9/23/2013	Ammonia	Not detected		
<b>VOCs</b>						
MW-1S	20 - 25	9/23/2013	Not detected			
<b>PNAs/PHENOLS</b>						
MW-1S	20 - 25	9/23/2013	Not detected			

Results reported in micrograms per liter (ug/l)

ft bsg feet below surface grade

NLV Not likely to volatilize

ID Insufficient data to develop criterion

 Reported concentration exceeds indicated cleanup criteria

Cleanup criteria from Attachment 1, Table 1, Part 201 Generic Cleanup Criteria and Screening Levels, December 30, 2013.

Refer to Appendix B for additional Part 201 Criteria Footnote definitions.

TABLE 6

Analytical Results Summary - Monitoring Well Groundwater Samples  
Remedial Investigation III  
Michigan Gas Utilities - Former Coldwater Chicago Street MGP

Well Number	Depth (ft bsg)	Date Sampled	Analyte	Concentration (µg/l)	Nonresidential Cleanup Criteria	
					Drinking Water Criteria	Volatilization to Indoor Air Inhalation Criteria
<b>METALS</b>						
MW-11	30 - 35	6/21/2012	Total Barium	100	2,000 (A)	NLV
			Total Cadmium	0.2	5 (A)	NLV
MW-11	30 - 35	6/21/2012	Available Cyanide	Not detected		
			Total Cyanide	Not detected		
			Total Sulfide	Not detected		
MW-11	30 - 35	6/21/2012	Ammonia	Not detected		
<b>VOCs</b>						
MW-11	30 - 35	6/21/2012	Tetrachloroethene	2	5 (A)	170,000
<b>PNAs/PHENOLS</b>						
MW-11	30 - 35	6/21/2012	2-Methylnaphthalene	5	750	25000 (S)
<b>METALS</b>						
MW-11	30 - 35	10/15/2012	Total Barium	100	2,000 (A)	NLV
MW-11	30 - 35	10/15/2012	Available Cyanide	Not detected		
<b>VOCs</b>						
MW-11	30 - 35	10/15/2012	Not detected			
<b>PNAs/PHENOLS</b>						
MW-11	30 - 35	10/15/2012	Not detected			
<b>METALS</b>						
MW-11	30 - 35	4/24/2013	Total Barium	100	2,000 (A)	NLV
MW-11	30 - 35	4/24/2013	Available Cyanide	Not detected		
MW-11	30 - 35	4/24/2013	Ammonia	Not detected		
<b>VOCs</b>						
MW-11	30 - 35	4/24/2013	Not detected			
<b>PNAs/PHENOLS</b>						
MW-11	30 - 35	4/24/2013	Not detected			
<b>METALS</b>						
MW-11	30 - 35	9/23/2013	Total Barium	100	2,000 (A)	NLV
MW-11	30 - 35	9/23/2013	Available Cyanide	Not detected		
MW-11	30 - 35	9/23/2013	Ammonia	Not detected		
<b>VOCs</b>						
MW-11	30 - 35	9/23/2013	Not detected			
<b>PNAs/PHENOLS</b>						
MW-11	30 - 35	9/23/2013	Not detected			

Results reported in micrograms per liter (µg/l)

ft bsg feet below surface grade

NLV Not likely to volatilize

ID Insufficient data to develop criterion

 Reported concentration exceeds indicated cleanup criteria

Cleanup criteria from Attachment 1, Table 1, Part 201 Generic Cleanup Criteria and Screening Levels, December 30, 2013.

Refer to Appendix B for additional Part 201 Criteria Footnote definitions.

**TABLE 6**

**Analytical Results Summary - Monitoring Well Groundwater Samples**  
**Remedial Investigation III**  
**Michigan Gas Utilities - Former Coldwater Chicago Street MGP**

Well Number	Depth (ft bsg)	Date Sampled	Analyte	Concentration (µg/l)	Nonresidential Cleanup Criteria	
					Drinking Water Criteria	Volatilization to Indoor Air Inhalation Criteria
<b>METALS</b>						
MW-1D	40 - 45	6/21/2012	Total Barium	200	2,000 (A)	NLV
MW-1D	40 - 45	6/21/2012	Available Cyanide	Not detected		
			Total Cyanide	Not detected		
			Total Sulfide	Not detected		
MW-1D	40 - 45	6/21/2012	Ammonia	Not detected		
<b>VOCs</b>						
MW-1D	40 - 45	6/21/2012	Not detected			
<b>PNAs/PHENOLS</b>						
MW-1D	40 - 45	6/21/2012	Not detected			
<b>METALS</b>						
MW-1D	40 - 45	10/15/2012	Total Barium	200	2,000 (A)	NLV
MW-1D	40 - 45	10/15/2012	Available Cyanide	Not detected		
<b>VOCs</b>						
MW-1D	40 - 45	10/15/2012	Not detected			
<b>PNAs/PHENOLS</b>						
MW-1D	40 - 45	10/15/2012	Not detected			
<b>METALS</b>						
MW-1D	40 - 45	4/24/2013	Total Barium	100	2,000 (A)	NLV
MW-1D	40 - 45	4/24/2013	Available Cyanide	Not detected		
MW-1D	40 - 45	4/24/2013	Ammonia	Not detected		
<b>VOCs</b>						
MW-1D	40 - 45	4/24/2013	Not detected			
<b>PNAs/PHENOLS</b>						
MW-1D	40 - 45	4/24/2013	Not detected			
<b>METALS</b>						
MW-1D	40 - 45	9/23/2013	Total Barium	100	2,000 (A)	NLV
			Total Copper	7	1,000 (E)	NLV
			Total Lead	3	4 (L)	NLV
			Total Zinc	20	5,000 (E)	NLV
MW-1D	40 - 45	9/23/2013	Available Cyanide	Not detected		
MW-1D	40 - 45	9/23/2013	Ammonia	Not detected		
<b>VOCs</b>						
MW-1D	40 - 45	9/23/2013	Not detected			
<b>PNAs/PHENOLS</b>						
MW-1D	40 - 45	9/23/2013	Not detected			

Results reported in micrograms per liter (ug/l)

ft bsg feet below surface grade

NLV Not likely to volatilize

ID Insufficient data to develop criterion

Reported concentration exceeds indicated cleanup criteria

Cleanup criteria from Attachment 1, Table 1, Part 201 Generic Cleanup Criteria and Screening Levels, December 30, 2013.

Refer to Appendix B for additional Part 201 Criteria Footnote definitions.

# **Appendix A**

## **Soil Boring Logs**

## **Appendix B**

Part 201 Cleanup Criteria Footnotes  
December 30, 2013

**ATTACHMENT B**  
**LABORATORY ANALYTICAL DATA PACKAGE**

Report Date:  
30-May-14 11:23



- Final Report
- Re-Issued Report
- Revised Report

**SPECTRUM ANALYTICAL, INC.**

Featuring

**HANIBAL TECHNOLOGY**

**Laboratory Report**

Tetra Tech, Inc  
1 S. Wacker Drive 37th Floor  
Chicago, IL 60606  
Attn: Kevin Scott

Project: Mich. Gas Util - Coldwater, MI  
Project #: 103X9026000

<u>Laboratory ID</u>	<u>Client Sample ID</u>	<u>Container</u>	<u>Matrix</u>	<u>Date Sampled</u>	<u>Date Received</u>
SB89600-01	MGU-SV-5	Summa canister 6 liter	Soli Gas	16-May-14 09:07	19-May-14 10:00
SB89600-02	MGU-SV-2	Summa canister 6 liter	Soli Gas	16-May-14 09:09	19-May-14 10:00
SB89600-03	MGU-OA-1	Summa canister 6 liter	Indoor/Ambient Air	16-May-14 08:51	19-May-14 10:00
SB89600-04	MGU-SV-4	Summa canister 6 liter	Soil Gas	16-May-14 09:50	19-May-14 10:00
SB89600-05	MGU-SV-1	Summa canister 6 liter	Soil Gas	16-May-14 09:04	19-May-14 10:00
SB89600-06	MGU-IA-1	Summa canister 6 liter	Indoor/Ambient Air	16-May-14 09:07	19-May-14 10:00
SB89600-07	MGU-IA-2	Summa canister 6 liter	Indoor/Ambient Air	16-May-14 09:04	19-May-14 10:00
SB89600-08	MGU-SV-3	Summa canister 6 liter	Soil Gas	16-May-14 09:10	19-May-14 10:00

I attest that the information contained within the report has been reviewed for accuracy and checked against the quality control requirements for each method. These results relate only to the sample(s) as received.

All applicable NELAC requirements have been met.

Massachusetts # M-MA138/MA1110  
Connecticut # PH-0777  
Florida # E87600/E87936  
Maine # MA138  
New Hampshire # 2538  
New Jersey # MA011/MA012  
New York # 11393/11840  
Pennsylvania # 68-04426/68-02924  
Rhode Island # 98  
USDA # S-51435



Authorized by:

Nicole Leja  
Laboratory Director

Spectrum Analytical holds certification in the State of New York for the analytes as indicated with an X in the "Cert." column within this report. Please note that the State of New York does not offer certification for all analytes. Please refer to our website for specific certification holdings in each state.

Please note that this report contains 40 pages of analytical data plus Chain of Custody document(s). When the Laboratory Report is indicated as revised, this report supersedes any previously dated reports for the laboratory ID(s) referenced above. Where this report identifies subcontracted analyses, copies of the subcontractor's test report are available upon request. This report may not be reproduced, except in full, without written approval from Spectrum Analytical, Inc.

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Please contact the Laboratory or Technical Director at 800-789-9115 with any questions regarding the data contained in this laboratory report.

**CASE NARRATIVE:**

Data has been reported to the RDL. This report excludes estimated concentrations detected below the RDL and above the MDL (J-Flag).

Samples are received and the pressure is recorded from the gauge on the canister. If a canister does not have a gauge, a vacuum gauge is attached to the valve and pressure is recorded. If the canister is below -10 psig, the can must be pressurized to 0 psig. Tedlar bags do not have the pressure recorded. The can pressure can be located within this report in the sample header information.

If a Duplicate (DUP) was not requested on the Chain of Custody, method criteria may have been fulfilled with a source sample not of this Sample Delivery Group.

**May 30, 2014 Report Revision Case Narrative:**

This report is being revised to correct client information.

**See below for any non-conformances and issues relating to quality control samples and/or sample analysis/matrix.**

**EPA TO-15**

**Calibration:**

1404030

---

Analyte quantified by quadratic equation type calibration.

1,1-Dichloroethene  
Methylene chloride

This affected the following samples:

1411391-BLK1  
1411391-BS1  
MGU-IA-1  
MGU-IA-2  
S403730-ICV1  
S405474-CCV1

Calibration 1404030

---

The %RSD for analyte Ethanol is 30.9%. The calculated %RSD for the RRF for each compound in the calibration must be less than 30% with at most two exceptions up to a limit of 40%. This affected the following samples:

MGU-IA-1  
MGU-IA-2

**Samples:**

SB89600-06                      *MGU-IA-1*

---

Elevated Reporting Limits due to the presence of high levels of non-target analytes; sample may not meet client requested reporting limit for this reason.

SB89600-07                      *MGU-IA-2*

---

Elevated Reporting Limits due to the presence of high levels of non-target analytes; sample may not meet client requested reporting limit for this reason.

**EPA TO-15L**

**Calibration:**

1405046

---

## EPA TO-15L

### **Calibration:**

1405046

---

Analyte quantified by quadratic equation type calibration.

1,2,4-Trichlorobenzene  
Bromomethane  
Chloroethane  
Naphthalene  
Propene

This affected the following samples:

1411869-BLK1  
1411869-BS1  
1411869-BSD1  
1412033-BLK1  
1412033-BS1  
MGU-OA-1  
MGU-SV-1  
MGU-SV-2  
MGU-SV-3  
MGU-SV-4  
MGU-SV-5  
S405349-ICV1  
S405787-CCV1  
S405787-CCV2  
S405831-CCV1

### **Laboratory Control Samples:**

1411869 BSD

---

Chloromethane RPD 43% (30%) is outside individual acceptance criteria.

### **Samples:**

S405787-CCV1

---

Analyte percent difference is outside individual acceptance criteria (30), but within overall method allowances.

Ethanol (-32.6%)

This affected the following samples:

1411869-BLK1  
1411869-BS1  
1411869-BSD1  
MGU-OA-1  
MGU-SV-1  
MGU-SV-2  
MGU-SV-3  
MGU-SV-4  
MGU-SV-5

S405787-CCV2

---

Analyte percent drift is outside individual acceptance criteria (30), but within overall method allowances.

1,2,4-Trichlorobenzene (35.2%)

**EPA TO-15L**

**Samples:**

S405787-CCV2

---

This affected the following samples:

1411869-BLK1  
1411869-BS1  
1411869-BSD1  
MGU-OA-1  
MGU-SV-1  
MGU-SV-2  
MGU-SV-3  
MGU-SV-4  
MGU-SV-5

SB89600-01                    *MGU-SV-5*

---

This flag indicates the concentration for this analyte is an estimated value due to exceeding the calibration range or interferences resulting in a biased final concentration.

Tetrachloroethene

SB89600-01RE1                *MGU-SV-5*

---

Sample dilution required for high concentration of target analytes to be within the instrument calibration range.

SB89600-05                    *MGU-SV-1*

---

This flag indicates the concentration for this analyte is an estimated value due to exceeding the calibration range or interferences resulting in a biased final concentration.

Isopropyl alcohol  
Tetrachloroethene

SB89600-05RE1                *MGU-SV-1*

---

Sample dilution required for high concentration of target analytes to be within the instrument calibration range.

SB89600-08                    *MGU-SV-3*

---

This flag indicates the concentration for this analyte is an estimated value due to exceeding the calibration range or interferences resulting in a biased final concentration.

Propene  
Tetrachloroethene

SB89600-08RE1                *MGU-SV-3*

---

Sample dilution required for high concentration of target analytes to be within the instrument calibration range.

S405787-CRL2

---

Low level calibration check failed, reportable sample concentrations may be biased high.

4-Methyl-2-pentanone (MIBK)

## Sample Acceptance Check Form

Client: Tetra Tech, Inc - Chicago, IL  
 Project: Mich. Gas Util - Coldwater, MI / 103X9026000  
 Work Order: SB89600  
 Sample(s) received on: 5/19/2014  
 Received by: Allison Edens

*The following outlines the condition of samples for the attached Chain of Custody upon receipt.*

	<u>Yes</u>	<u>No</u>	<u>N/A</u>
1. Were custody seals present?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Were custody seals intact?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Were samples received at a temperature of $\leq 6^{\circ}\text{C}$ ?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4. Were samples cooled on ice upon transfer to laboratory representative?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5. Were samples refrigerated upon transfer to laboratory representative?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
6. Were sample containers received intact?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Were samples properly labeled (labels affixed to sample containers and include sample ID, site location, and/or project number and the collection date)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Were samples accompanied by a Chain of Custody document?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Does Chain of Custody document include proper, full, and complete documentation, which shall include sample ID, site location, and/or project number, date and time of collection, collector's name, preservation type, sample matrix and any special remarks concerning the sample?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Did sample container labels agree with Chain of Custody document?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Were samples received within method-specific holding times?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Sample Identification

MGU-SV-5  
SB89600-01

Client Project #  
103X9026000

Matrix  
Soli Gas

Collection Date/Time  
16-May-14 09:07

Received  
19-May-14

<u>CAS No.</u>	<u>Analyte(s)</u>	<u>Result/Units</u>	<u>*RDL</u>	<u>Result ug/m<sup>3</sup></u>	<u>*RDL</u>	<u>Flag</u>	<u>Method Ref.</u>	<u>Analyzed</u>	<u>Analyst</u>	<u>Batch</u>	<u>Cert.</u>
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**Air Quality Analyses**

Volatile Organics in Air Low Level

ppbv

Prepared 22-May-14  
Dilution: 1

Can pressure: -2  
Can ID: 0666

115-07-1	Propene	< 0.100	0.100	< 0.17	0.17		EPA TO-15L	23-May-14	KRL	1411869	
75-71-8	Dichlorodifluoromethane (Freon12)	<b>0.580</b>	0.100	<b>2.87</b>	0.49		"	"	"	"	X
74-87-3	Chloromethane	< 0.100	0.100	< 0.21	0.21		"	"	"	"	X
76-14-2	1,2-Dichlorotetrafluoroethane (Freon 114)	< 0.100	0.100	< 0.70	0.70		"	"	"	"	X
75-01-4	Vinyl chloride	< 0.100	0.100	< 0.26	0.26		"	"	"	"	X
106-99-0	1,3-Butadiene	< 0.100	0.100	< 0.22	0.22		"	"	"	"	X
74-83-9	Bromomethane	< 0.100	0.100	< 0.39	0.39		"	"	"	"	X
75-00-3	Chloroethane	< 0.100	0.100	< 0.26	0.26		"	"	"	"	X
67-64-1	Acetone	<b>5.06</b>	0.500	<b>12.02</b>	1.19		"	"	"	"	X
75-69-4	Trichlorofluoromethane (Freon 11)	<b>0.250</b>	0.100	<b>1.40</b>	0.56		"	"	"	"	X
64-17-5	Ethanol	<b>8.80</b>	0.500	<b>16.59</b>	0.94		"	"	"	"	
107-13-1	Acrylonitrile	< 0.100	0.100	< 0.22	0.22		"	"	"	"	X
75-35-4	1,1-Dichloroethene	< 0.100	0.100	< 0.40	0.40		"	"	"	"	X
75-09-2	Methylene chloride	<b>0.170</b>	0.100	<b>0.59</b>	0.35		"	"	"	"	X
76-13-1	1,1,2-Trichlorotrifluoroethane (Freon 113)	< 0.100	0.100	< 0.77	0.77		"	"	"	"	X
75-15-0	Carbon disulfide	< 0.500	0.500	< 1.56	1.56		"	"	"	"	X
156-60-5	trans-1,2-Dichloroethene	< 0.100	0.100	< 0.40	0.40		"	"	"	"	X
75-34-3	1,1-Dichloroethane	< 0.100	0.100	< 0.40	0.40		"	"	"	"	X
1634-04-4	Methyl tert-butyl ether	< 0.100	0.100	< 0.36	0.36		"	"	"	"	X
67-63-0	Isopropyl alcohol	<b>1.43</b>	0.500	<b>3.51</b>	1.23		"	"	"	"	X
78-93-3	2-Butanone (MEK)	<b>0.900</b>	0.100	<b>2.65</b>	0.29		"	"	"	"	X
156-59-2	cis-1,2-Dichloroethene	< 0.100	0.100	< 0.40	0.40		"	"	"	"	X
110-54-3	Hexane	<b>0.530</b>	0.500	<b>1.87</b>	1.76		"	"	"	"	X
141-78-6	Ethyl acetate	<b>3.03</b>	0.100	<b>10.92</b>	0.36		"	"	"	"	
67-66-3	Chloroform	<b>8.01</b>	0.100	<b>38.99</b>	0.49		"	"	"	"	X
109-99-9	Tetrahydrofuran	< 0.100	0.100	< 0.29	0.29		"	"	"	"	
107-06-2	1,2-Dichloroethane	< 0.100	0.100	< 0.40	0.40		"	"	"	"	X
71-55-6	1,1,1-Trichloroethane	<b>0.290</b>	0.100	<b>1.58</b>	0.55		"	"	"	"	X
71-43-2	Benzene	<b>0.120</b>	0.100	<b>0.38</b>	0.32		"	"	"	"	X
56-23-5	Carbon tetrachloride	<b>0.320</b>	0.100	<b>2.01</b>	0.63		"	"	"	"	X
110-82-7	Cyclohexane	< 0.100	0.100	< 0.34	0.34		"	"	"	"	X
78-87-5	1,2-Dichloropropane	< 0.100	0.100	< 0.46	0.46		"	"	"	"	X
75-27-4	Bromodichloromethane	<b>3.60</b>	0.100	<b>24.12</b>	0.67		"	"	"	"	X
79-01-6	Trichloroethene	< 0.100	0.100	< 0.54	0.54		"	"	"	"	X
123-91-1	1,4-Dioxane	< 0.500	0.500	< 1.80	1.80		"	"	"	"	X
142-82-5	n-Heptane	< 0.100	0.100	< 0.41	0.41		"	"	"	"	X
108-10-1	4-Methyl-2-pentanone (MIBK)	< 0.100	0.100	< 0.41	0.41		"	"	"	"	X
10061-01-5	cis-1,3-Dichloropropene	< 0.100	0.100	< 0.45	0.45		"	"	"	"	X
10061-02-6	trans-1,3-Dichloropropene	< 0.100	0.100	< 0.45	0.45		"	"	"	"	X
79-00-5	1,1,2-Trichloroethane	< 0.100	0.100	< 0.55	0.55		"	"	"	"	X
108-88-3	Toluene	<b>0.340</b>	0.100	<b>1.28</b>	0.38		"	"	"	"	X
591-78-6	2-Hexanone (MBK)	< 0.100	0.100	< 0.41	0.41		"	"	"	"	
124-48-1	Dibromochloromethane	< 0.100	0.100	< 0.85	0.85		"	"	"	"	X
106-93-4	1,2-Dibromoethane (EDB)	< 0.100	0.100	< 0.77	0.77		"	"	"	"	X

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Sample Identification

MGU-SV-5  
SB89600-01

Client Project #  
103X9026000

Matrix  
Soli Gas

Collection Date/Time  
16-May-14 09:07

Received  
19-May-14

<u>CAS No.</u>	<u>Analyte(s)</u>	<u>Result/Units</u>	<u>*RDL</u>	<u>Result ug/m<sup>3</sup></u>	<u>*RDL</u>	<u>Flag</u>	<u>Method Ref.</u>	<u>Analyzed</u>	<u>Analyst</u>	<u>Batch</u>	<u>Cert.</u>
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**Air Quality Analyses**

Volatile Organics in Air Low Level

ppbv

Prepared 22-May-14  
Dilution: 1

Can pressure: -2  
Can ID: 0666

127-18-4	Tetrachloroethene	34.5	0.100	233.95	0.68	E	EPA TO-15L	23-May-14	KRL	1411869	X
108-90-7	Chlorobenzene	< 0.100	0.100	< 0.46	0.46		"	"	"	"	X
630-20-6	1,1,1,2-Tetrachloroethane	< 0.100	0.100	< 0.69	0.69		"	"	"	"	
100-41-4	Ethylbenzene	< 0.100	0.100	< 0.43	0.43		"	"	"	"	X
179601-23-1	m,p-Xylene	< 0.200	0.200	< 0.87	0.87		"	"	"	"	X
75-25-2	Bromoform	< 0.100	0.100	< 1.03	1.03		"	"	"	"	X
100-42-5	Styrene	< 0.100	0.100	< 0.43	0.43		"	"	"	"	X
95-47-6	o-Xylene	< 0.100	0.100	< 0.43	0.43		"	"	"	"	X
79-34-5	1,1,2,2-Tetrachloroethane	< 0.100	0.100	< 0.69	0.69		"	"	"	"	X
98-82-8	Isopropylbenzene	< 0.100	0.100	< 0.49	0.49		"	"	"	"	X
108-67-8	1,3,5-Trimethylbenzene	< 0.100	0.100	< 0.49	0.49		"	"	"	"	X
622-96-8	4-Ethyltoluene	< 0.100	0.100	< 0.49	0.49		"	"	"	"	
95-63-6	1,2,4-Trimethylbenzene	< 0.100	0.100	< 0.49	0.49		"	"	"	"	X
91-20-3	Naphthalene	< 0.500	0.500	< 2.62	2.62		"	"	"	"	X
541-73-1	1,3-Dichlorobenzene	< 0.100	0.100	< 0.60	0.60		"	"	"	"	X
100-44-7	Benzyl chloride	< 0.100	0.100	< 0.52	0.52		"	"	"	"	X
106-46-7	1,4-Dichlorobenzene	< 0.100	0.100	< 0.60	0.60		"	"	"	"	X
135-98-8	sec-Butylbenzene	< 0.100	0.100	< 0.55	0.55		"	"	"	"	
99-87-6	4-Isopropyltoluene	< 0.100	0.100	< 0.54	0.54		"	"	"	"	
95-50-1	1,2-Dichlorobenzene	< 0.100	0.100	< 0.60	0.60		"	"	"	"	X
104-51-8	n-Butylbenzene	< 0.100	0.100	< 0.55	0.55		"	"	"	"	
120-82-1	1,2,4-Trichlorobenzene	< 0.100	0.100	< 0.74	0.74		"	"	"	"	X
87-68-3	Hexachlorobutadiene	< 0.100	0.100	< 1.07	1.07		"	"	"	"	X

Surrogate recoveries:

460-00-4	4-Bromofluorobenzene	105		70-130 %			"	"	"	"	
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Re-analysis of Volatile Organics in Air Low Level

Dilution: 5

GS1

127-18-4	Tetrachloroethene	34.4	0.500	233.27	3.39	D	EPA TO-15L	23-May-14	KRL	1411869	X
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Surrogate recoveries:

460-00-4	4-Bromofluorobenzene	100		70-130 %			"	"	"	"	
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Sample Identification

MGU-SV-2  
SB89600-02

Client Project #  
103X9026000

Matrix  
Soli Gas

Collection Date/Time  
16-May-14 09:09

Received  
19-May-14

<u>CAS No.</u>	<u>Analyte(s)</u>	<u>Result/Units</u>	<u>*RDL</u>	<u>Result ug/m<sup>3</sup></u>	<u>*RDL</u>	<u>Flag</u>	<u>Method Ref.</u>	<u>Analyzed</u>	<u>Analyst</u>	<u>Batch</u>	<u>Cert.</u>
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**Air Quality Analyses**

Volatile Organics in Air Low Level

ppbv      Prepared 22-May-14  
Dilution: 1

Can pressure: -1  
Can ID: 0488

115-07-1	Propene	< 0.100	0.100	< 0.17	0.17		EPA TO-15L	23-May-14	KRL	1411869	
75-71-8	Dichlorodifluoromethane (Freon12)	<b>0.580</b>	0.100	<b>2.87</b>	0.49		"	"	"	"	X
74-87-3	Chloromethane	< 0.100	0.100	< 0.21	0.21		"	"	"	"	X
76-14-2	1,2-Dichlorotetrafluoroethane (Freon 114)	< 0.100	0.100	< 0.70	0.70		"	"	"	"	X
75-01-4	Vinyl chloride	< 0.100	0.100	< 0.26	0.26		"	"	"	"	X
106-99-0	1,3-Butadiene	< 0.100	0.100	< 0.22	0.22		"	"	"	"	X
74-83-9	Bromomethane	< 0.100	0.100	< 0.39	0.39		"	"	"	"	X
75-00-3	Chloroethane	< 0.100	0.100	< 0.26	0.26		"	"	"	"	X
67-64-1	Acetone	<b>16.3</b>	0.500	<b>38.73</b>	1.19		"	"	"	"	X
75-69-4	Trichlorofluoromethane (Freon 11)	<b>0.260</b>	0.100	<b>1.46</b>	0.56		"	"	"	"	X
64-17-5	Ethanol	<b>6.56</b>	0.500	<b>12.37</b>	0.94		"	"	"	"	
107-13-1	Acrylonitrile	< 0.100	0.100	< 0.22	0.22		"	"	"	"	X
75-35-4	1,1-Dichloroethene	< 0.100	0.100	< 0.40	0.40		"	"	"	"	X
75-09-2	Methylene chloride	<b>0.190</b>	0.100	<b>0.66</b>	0.35		"	"	"	"	X
76-13-1	1,1,2-Trichlorotrifluoroethane (Freon 113)	< 0.100	0.100	< 0.77	0.77		"	"	"	"	X
75-15-0	Carbon disulfide	<b>0.540</b>	0.500	<b>1.68</b>	1.56		"	"	"	"	X
156-60-5	trans-1,2-Dichloroethene	< 0.100	0.100	< 0.40	0.40		"	"	"	"	X
75-34-3	1,1-Dichloroethane	< 0.100	0.100	< 0.40	0.40		"	"	"	"	X
1634-04-4	Methyl tert-butyl ether	< 0.100	0.100	< 0.36	0.36		"	"	"	"	X
67-63-0	Isopropyl alcohol	<b>1.78</b>	0.500	<b>4.37</b>	1.23		"	"	"	"	X
78-93-3	2-Butanone (MEK)	<b>1.31</b>	0.100	<b>3.86</b>	0.29		"	"	"	"	X
156-59-2	cis-1,2-Dichloroethene	< 0.100	0.100	< 0.40	0.40		"	"	"	"	X
110-54-3	Hexane	< 0.500	0.500	< 1.76	1.76		"	"	"	"	X
141-78-6	Ethyl acetate	< 0.100	0.100	< 0.36	0.36		"	"	"	"	
67-66-3	Chloroform	<b>0.120</b>	0.100	<b>0.58</b>	0.49		"	"	"	"	X
109-99-9	Tetrahydrofuran	< 0.100	0.100	< 0.29	0.29		"	"	"	"	
107-06-2	1,2-Dichloroethane	< 0.100	0.100	< 0.40	0.40		"	"	"	"	X
71-55-6	1,1,1-Trichloroethane	<b>0.240</b>	0.100	<b>1.31</b>	0.55		"	"	"	"	X
71-43-2	Benzene	<b>0.190</b>	0.100	<b>0.61</b>	0.32		"	"	"	"	X
56-23-5	Carbon tetrachloride	< 0.100	0.100	< 0.63	0.63		"	"	"	"	X
110-82-7	Cyclohexane	<b>0.340</b>	0.100	<b>1.17</b>	0.34		"	"	"	"	X
78-87-5	1,2-Dichloropropane	< 0.100	0.100	< 0.46	0.46		"	"	"	"	X
75-27-4	Bromodichloromethane	< 0.100	0.100	< 0.67	0.67		"	"	"	"	X
79-01-6	Trichloroethene	< 0.100	0.100	< 0.54	0.54		"	"	"	"	X
123-91-1	1,4-Dioxane	< 0.500	0.500	< 1.80	1.80		"	"	"	"	X
142-82-5	n-Heptane	< 0.100	0.100	< 0.41	0.41		"	"	"	"	X
108-10-1	4-Methyl-2-pentanone (MIBK)	< 0.100	0.100	< 0.41	0.41		"	"	"	"	X
10061-01-5	cis-1,3-Dichloropropene	< 0.100	0.100	< 0.45	0.45		"	"	"	"	X
10061-02-6	trans-1,3-Dichloropropene	< 0.100	0.100	< 0.45	0.45		"	"	"	"	X
79-00-5	1,1,2-Trichloroethane	< 0.100	0.100	< 0.55	0.55		"	"	"	"	X
108-88-3	Toluene	< 0.100	0.100	< 0.38	0.38		"	"	"	"	X
591-78-6	2-Hexanone (MBK)	< 0.100	0.100	< 0.41	0.41		"	"	"	"	
124-48-1	Dibromochloromethane	< 0.100	0.100	< 0.85	0.85		"	"	"	"	X
106-93-4	1,2-Dibromoethane (EDB)	< 0.100	0.100	< 0.77	0.77		"	"	"	"	X

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Sample Identification

MGU-SV-2  
SB89600-02

Client Project #  
103X9026000

Matrix  
Soli Gas

Collection Date/Time  
16-May-14 09:09

Received  
19-May-14

<u>CAS No.</u>	<u>Analyte(s)</u>	<u>Result/Units</u>	<u>*RDL</u>	<u>Result ug/m<sup>3</sup></u>	<u>*RDL</u>	<u>Flag</u>	<u>Method Ref.</u>	<u>Analyzed</u>	<u>Analyst</u>	<u>Batch</u>	<u>Cert.</u>
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**Air Quality Analyses**

Volatile Organics in Air Low Level

ppbv

Prepared 22-May-14  
Dilution: 1

Can pressure: -1  
Can ID: 0488

127-18-4	Tetrachloroethene	1.30	0.100	8.82	0.68		EPA TO-15L	23-May-14	KRL	1411869	X
108-90-7	Chlorobenzene	< 0.100	0.100	< 0.46	0.46		"	"	"	"	X
630-20-6	1,1,1,2-Tetrachloroethane	< 0.100	0.100	< 0.69	0.69		"	"	"	"	
100-41-4	Ethylbenzene	< 0.100	0.100	< 0.43	0.43		"	"	"	"	X
179601-23-1	m,p-Xylene	< 0.200	0.200	< 0.87	0.87		"	"	"	"	X
75-25-2	Bromoform	< 0.100	0.100	< 1.03	1.03		"	"	"	"	X
100-42-5	Styrene	< 0.100	0.100	< 0.43	0.43		"	"	"	"	X
95-47-6	o-Xylene	< 0.100	0.100	< 0.43	0.43		"	"	"	"	X
79-34-5	1,1,2,2-Tetrachloroethane	< 0.100	0.100	< 0.69	0.69		"	"	"	"	X
98-82-8	Isopropylbenzene	< 0.100	0.100	< 0.49	0.49		"	"	"	"	X
108-67-8	1,3,5-Trimethylbenzene	< 0.100	0.100	< 0.49	0.49		"	"	"	"	X
622-96-8	4-Ethyltoluene	< 0.100	0.100	< 0.49	0.49		"	"	"	"	
95-63-6	1,2,4-Trimethylbenzene	< 0.100	0.100	< 0.49	0.49		"	"	"	"	X
91-20-3	Naphthalene	< 0.500	0.500	< 2.62	2.62		"	"	"	"	X
541-73-1	1,3-Dichlorobenzene	< 0.100	0.100	< 0.60	0.60		"	"	"	"	X
100-44-7	Benzyl chloride	< 0.100	0.100	< 0.52	0.52		"	"	"	"	X
106-46-7	1,4-Dichlorobenzene	< 0.100	0.100	< 0.60	0.60		"	"	"	"	X
135-98-8	sec-Butylbenzene	< 0.100	0.100	< 0.55	0.55		"	"	"	"	
99-87-6	4-Isopropyltoluene	< 0.100	0.100	< 0.54	0.54		"	"	"	"	
95-50-1	1,2-Dichlorobenzene	< 0.100	0.100	< 0.60	0.60		"	"	"	"	X
104-51-8	n-Butylbenzene	< 0.100	0.100	< 0.55	0.55		"	"	"	"	
120-82-1	1,2,4-Trichlorobenzene	< 0.100	0.100	< 0.74	0.74		"	"	"	"	X
87-68-3	Hexachlorobutadiene	< 0.100	0.100	< 1.07	1.07		"	"	"	"	X

Surrogate recoveries:

460-00-4	4-Bromofluorobenzene	102		70-130 %			"	"	"	"	
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Sample Identification

MGU-OA-1  
SB89600-03

Client Project #  
103X9026000

Matrix  
Indoor/Ambient Air

Collection Date/Time  
16-May-14 08:51

Received  
19-May-14

<u>CAS No.</u>	<u>Analyte(s)</u>	<u>Result/Units</u>	<u>*RDL</u>	<u>Result ug/m<sup>3</sup></u>	<u>*RDL</u>	<u>Flag</u>	<u>Method Ref.</u>	<u>Analyzed</u>	<u>Analyst</u>	<u>Batch</u>	<u>Cert.</u>
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**Air Quality Analyses**

Volatile Organics in Air Low Level

ppbv      Prepared 22-May-14  
Dilution: 1

Can pressure: -2  
Can ID: 0207

115-07-1	Propene	< 0.100	0.100	< 0.17	0.17		EPA TO-15L	24-May-14	KRL	1411869	
75-71-8	Dichlorodifluoromethane (Freon12)	<b>0.600</b>	0.100	<b>2.97</b>	0.49		"	"	"	"	X
74-87-3	Chloromethane	< 0.100	0.100	< 0.21	0.21		"	"	"	"	X
76-14-2	1,2-Dichlorotetrafluoroethane (Freon 114)	< 0.100	0.100	< 0.70	0.70		"	"	"	"	X
75-01-4	Vinyl chloride	< 0.100	0.100	< 0.26	0.26		"	"	"	"	X
106-99-0	1,3-Butadiene	< 0.100	0.100	< 0.22	0.22		"	"	"	"	X
74-83-9	Bromomethane	< 0.100	0.100	< 0.39	0.39		"	"	"	"	X
75-00-3	Chloroethane	< 0.100	0.100	< 0.26	0.26		"	"	"	"	X
67-64-1	Acetone	<b>4.41</b>	0.500	<b>10.48</b>	1.19		"	"	"	"	X
75-69-4	Trichlorofluoromethane (Freon 11)	<b>0.240</b>	0.100	<b>1.35</b>	0.56		"	"	"	"	X
64-17-5	Ethanol	<b>3.06</b>	0.500	<b>5.77</b>	0.94		"	"	"	"	X
107-13-1	Acrylonitrile	< 0.100	0.100	< 0.22	0.22		"	"	"	"	X
75-35-4	1,1-Dichloroethene	< 0.100	0.100	< 0.40	0.40		"	"	"	"	X
75-09-2	Methylene chloride	<b>0.200</b>	0.100	<b>0.69</b>	0.35		"	"	"	"	X
76-13-1	1,1,2-Trichlorotrifluoroethane (Freon 113)	< 0.100	0.100	< 0.77	0.77		"	"	"	"	X
75-15-0	Carbon disulfide	< 0.500	0.500	< 1.56	1.56		"	"	"	"	X
156-60-5	trans-1,2-Dichloroethene	< 0.100	0.100	< 0.40	0.40		"	"	"	"	X
75-34-3	1,1-Dichloroethane	< 0.100	0.100	< 0.40	0.40		"	"	"	"	X
1634-04-4	Methyl tert-butyl ether	< 0.100	0.100	< 0.36	0.36		"	"	"	"	X
67-63-0	Isopropyl alcohol	<b>0.540</b>	0.500	<b>1.33</b>	1.23		"	"	"	"	X
78-93-3	2-Butanone (MEK)	<b>0.390</b>	0.100	<b>1.15</b>	0.29		"	"	"	"	X
156-59-2	cis-1,2-Dichloroethene	< 0.100	0.100	< 0.40	0.40		"	"	"	"	X
110-54-3	Hexane	< 0.500	0.500	< 1.76	1.76		"	"	"	"	X
141-78-6	Ethyl acetate	<b>1.44</b>	0.100	<b>5.19</b>	0.36		"	"	"	"	X
67-66-3	Chloroform	< 0.100	0.100	< 0.49	0.49		"	"	"	"	X
109-99-9	Tetrahydrofuran	< 0.100	0.100	< 0.29	0.29		"	"	"	"	X
107-06-2	1,2-Dichloroethane	< 0.100	0.100	< 0.40	0.40		"	"	"	"	X
71-55-6	1,1,1-Trichloroethane	< 0.100	0.100	< 0.55	0.55		"	"	"	"	X
71-43-2	Benzene	<b>0.130</b>	0.100	<b>0.41</b>	0.32		"	"	"	"	X
56-23-5	Carbon tetrachloride	< 0.100	0.100	< 0.63	0.63		"	"	"	"	X
110-82-7	Cyclohexane	< 0.100	0.100	< 0.34	0.34		"	"	"	"	X
78-87-5	1,2-Dichloropropane	< 0.100	0.100	< 0.46	0.46		"	"	"	"	X
75-27-4	Bromodichloromethane	< 0.100	0.100	< 0.67	0.67		"	"	"	"	X
79-01-6	Trichloroethene	< 0.100	0.100	< 0.54	0.54		"	"	"	"	X
123-91-1	1,4-Dioxane	< 0.500	0.500	< 1.80	1.80		"	"	"	"	X
142-82-5	n-Heptane	< 0.100	0.100	< 0.41	0.41		"	"	"	"	X
108-10-1	4-Methyl-2-pentanone (MIBK)	< 0.100	0.100	< 0.41	0.41		"	"	"	"	X
10061-01-5	cis-1,3-Dichloropropene	< 0.100	0.100	< 0.45	0.45		"	"	"	"	X
10061-02-6	trans-1,3-Dichloropropene	< 0.100	0.100	< 0.45	0.45		"	"	"	"	X
79-00-5	1,1,2-Trichloroethane	< 0.100	0.100	< 0.55	0.55		"	"	"	"	X
108-88-3	Toluene	<b>0.170</b>	0.100	<b>0.64</b>	0.38		"	"	"	"	X
591-78-6	2-Hexanone (MBK)	< 0.100	0.100	< 0.41	0.41		"	"	"	"	X
124-48-1	Dibromochloromethane	< 0.100	0.100	< 0.85	0.85		"	"	"	"	X
106-93-4	1,2-Dibromoethane (EDB)	< 0.100	0.100	< 0.77	0.77		"	"	"	"	X

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Sample Identification

MGU-OA-1  
SB89600-03

Client Project #  
103X9026000

Matrix  
Indoor/Ambient Air

Collection Date/Time  
16-May-14 08:51

Received  
19-May-14

<u>CAS No.</u>	<u>Analyte(s)</u>	<u>Result/Units</u>	<u>*RDL</u>	<u>Result ug/m<sup>3</sup></u>	<u>*RDL</u>	<u>Flag</u>	<u>Method Ref.</u>	<u>Analyzed</u>	<u>Analyst</u>	<u>Batch</u>	<u>Cert.</u>
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**Air Quality Analyses**

Volatile Organics in Air Low Level

ppbv

Prepared 22-May-14  
Dilution: 1

Can pressure: -2  
Can ID: 0207

127-18-4	Tetrachloroethene	< 0.100	0.100	< 0.68	0.68		EPA TO-15L	24-May-14	KRL	1411869	X
108-90-7	Chlorobenzene	< 0.100	0.100	< 0.46	0.46		"	"	"	"	X
630-20-6	1,1,1,2-Tetrachloroethane	< 0.100	0.100	< 0.69	0.69		"	"	"	"	
100-41-4	Ethylbenzene	< 0.100	0.100	< 0.43	0.43		"	"	"	"	X
179601-23-1	m,p-Xylene	< 0.200	0.200	< 0.87	0.87		"	"	"	"	X
75-25-2	Bromoform	< 0.100	0.100	< 1.03	1.03		"	"	"	"	X
100-42-5	Styrene	< 0.100	0.100	< 0.43	0.43		"	"	"	"	X
95-47-6	o-Xylene	< 0.100	0.100	< 0.43	0.43		"	"	"	"	X
79-34-5	1,1,2,2-Tetrachloroethane	< 0.100	0.100	< 0.69	0.69		"	"	"	"	X
98-82-8	Isopropylbenzene	< 0.100	0.100	< 0.49	0.49		"	"	"	"	X
108-67-8	1,3,5-Trimethylbenzene	< 0.100	0.100	< 0.49	0.49		"	"	"	"	X
622-96-8	4-Ethyltoluene	< 0.100	0.100	< 0.49	0.49		"	"	"	"	
95-63-6	1,2,4-Trimethylbenzene	< 0.100	0.100	< 0.49	0.49		"	"	"	"	X
91-20-3	Naphthalene	< 0.500	0.500	< 2.62	2.62		"	"	"	"	X
541-73-1	1,3-Dichlorobenzene	< 0.100	0.100	< 0.60	0.60		"	"	"	"	X
100-44-7	Benzyl chloride	< 0.100	0.100	< 0.52	0.52		"	"	"	"	X
106-46-7	1,4-Dichlorobenzene	< 0.100	0.100	< 0.60	0.60		"	"	"	"	X
135-98-8	sec-Butylbenzene	< 0.100	0.100	< 0.55	0.55		"	"	"	"	
99-87-6	4-Isopropyltoluene	< 0.100	0.100	< 0.54	0.54		"	"	"	"	
95-50-1	1,2-Dichlorobenzene	< 0.100	0.100	< 0.60	0.60		"	"	"	"	X
104-51-8	n-Butylbenzene	< 0.100	0.100	< 0.55	0.55		"	"	"	"	
120-82-1	1,2,4-Trichlorobenzene	< 0.100	0.100	< 0.74	0.74		"	"	"	"	X
87-68-3	Hexachlorobutadiene	< 0.100	0.100	< 1.07	1.07		"	"	"	"	X

Surrogate recoveries:

460-00-4	4-Bromofluorobenzene	103		70-130 %			"	"	"	"	
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Sample Identification

MGU-SV-4  
SB89600-04

Client Project #  
103X9026000

Matrix  
Soil Gas

Collection Date/Time  
16-May-14 09:50

Received  
19-May-14

<u>CAS No.</u>	<u>Analyte(s)</u>	<u>Result/Units</u>	<u>*RDL</u>	<u>Result ug/m<sup>3</sup></u>	<u>*RDL</u>	<u>Flag</u>	<u>Method Ref.</u>	<u>Analyzed</u>	<u>Analyst</u>	<u>Batch</u>	<u>Cert.</u>
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**Air Quality Analyses**

Volatile Organics in Air Low Level

ppbv

Prepared 22-May-14  
Dilution: 1

Can pressure: -20  
Can ID: 0242

115-07-1	Propene	4.83	0.100	8.31	0.17		EPA TO-15L	24-May-14	KRL	1411869	
75-71-8	Dichlorodifluoromethane (Freon12)	0.240	0.100	1.19	0.49		"	"	"	"	X
74-87-3	Chloromethane	< 0.100	0.100	< 0.21	0.21		"	"	"	"	X
76-14-2	1,2-Dichlorotetrafluoroethane (Freon 114)	< 0.100	0.100	< 0.70	0.70		"	"	"	"	X
75-01-4	Vinyl chloride	< 0.100	0.100	< 0.26	0.26		"	"	"	"	X
106-99-0	1,3-Butadiene	< 0.100	0.100	< 0.22	0.22		"	"	"	"	X
74-83-9	Bromomethane	< 0.100	0.100	< 0.39	0.39		"	"	"	"	X
75-00-3	Chloroethane	< 0.100	0.100	< 0.26	0.26		"	"	"	"	X
67-64-1	Acetone	2.96	0.500	7.03	1.19		"	"	"	"	X
75-69-4	Trichlorofluoromethane (Freon 11)	0.130	0.100	0.73	0.56		"	"	"	"	X
64-17-5	Ethanol	6.92	0.500	13.05	0.94		"	"	"	"	
107-13-1	Acrylonitrile	< 0.100	0.100	< 0.22	0.22		"	"	"	"	X
75-35-4	1,1-Dichloroethene	< 0.100	0.100	< 0.40	0.40		"	"	"	"	X
75-09-2	Methylene chloride	1.67	0.100	5.80	0.35		"	"	"	"	X
76-13-1	1,1,2-Trichlorotrifluoroethane (Freon 113)	< 0.100	0.100	< 0.77	0.77		"	"	"	"	X
75-15-0	Carbon disulfide	< 0.500	0.500	< 1.56	1.56		"	"	"	"	X
156-60-5	trans-1,2-Dichloroethene	< 0.100	0.100	< 0.40	0.40		"	"	"	"	X
75-34-3	1,1-Dichloroethane	< 0.100	0.100	< 0.40	0.40		"	"	"	"	X
1634-04-4	Methyl tert-butyl ether	< 0.100	0.100	< 0.36	0.36		"	"	"	"	X
67-63-0	Isopropyl alcohol	< 0.500	0.500	< 1.23	1.23		"	"	"	"	X
78-93-3	2-Butanone (MEK)	< 0.100	0.100	< 0.29	0.29		"	"	"	"	X
156-59-2	cis-1,2-Dichloroethene	< 0.100	0.100	< 0.40	0.40		"	"	"	"	X
110-54-3	Hexane	0.540	0.500	1.90	1.76		"	"	"	"	X
141-78-6	Ethyl acetate	3.89	0.100	14.02	0.36		"	"	"	"	
67-66-3	Chloroform	< 0.100	0.100	< 0.49	0.49		"	"	"	"	X
109-99-9	Tetrahydrofuran	< 0.100	0.100	< 0.29	0.29		"	"	"	"	
107-06-2	1,2-Dichloroethane	< 0.100	0.100	< 0.40	0.40		"	"	"	"	X
71-55-6	1,1,1-Trichloroethane	0.100	0.100	0.55	0.55		"	"	"	"	X
71-43-2	Benzene	0.190	0.100	0.61	0.32		"	"	"	"	X
56-23-5	Carbon tetrachloride	< 0.100	0.100	< 0.63	0.63		"	"	"	"	X
110-82-7	Cyclohexane	< 0.100	0.100	< 0.34	0.34		"	"	"	"	X
78-87-5	1,2-Dichloropropane	< 0.100	0.100	< 0.46	0.46		"	"	"	"	X
75-27-4	Bromodichloromethane	< 0.100	0.100	< 0.67	0.67		"	"	"	"	X
79-01-6	Trichloroethene	< 0.100	0.100	< 0.54	0.54		"	"	"	"	X
123-91-1	1,4-Dioxane	< 0.500	0.500	< 1.80	1.80		"	"	"	"	X
142-82-5	n-Heptane	< 0.100	0.100	< 0.41	0.41		"	"	"	"	X
108-10-1	4-Methyl-2-pentanone (MIBK)	< 0.100	0.100	< 0.41	0.41		"	"	"	"	X
10061-01-5	cis-1,3-Dichloropropene	< 0.100	0.100	< 0.45	0.45		"	"	"	"	X
10061-02-6	trans-1,3-Dichloropropene	< 0.100	0.100	< 0.45	0.45		"	"	"	"	X
79-00-5	1,1,2-Trichloroethane	< 0.100	0.100	< 0.55	0.55		"	"	"	"	X
108-88-3	Toluene	0.560	0.100	2.11	0.38		"	"	"	"	X
591-78-6	2-Hexanone (MBK)	< 0.100	0.100	< 0.41	0.41		"	"	"	"	
124-48-1	Dibromochloromethane	< 0.100	0.100	< 0.85	0.85		"	"	"	"	X
106-93-4	1,2-Dibromoethane (EDB)	< 0.100	0.100	< 0.77	0.77		"	"	"	"	X

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Sample Identification

MGU-SV-4  
SB89600-04

Client Project #  
103X9026000

Matrix  
Soil Gas

Collection Date/Time  
16-May-14 09:50

Received  
19-May-14

<u>CAS No.</u>	<u>Analyte(s)</u>	<u>Result/Units</u>	<u>*RDL</u>	<u>Result ug/m<sup>3</sup></u>	<u>*RDL</u>	<u>Flag</u>	<u>Method Ref.</u>	<u>Analyzed</u>	<u>Analyst</u>	<u>Batch</u>	<u>Cert.</u>
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**Air Quality Analyses**

Volatile Organics in Air Low Level

ppbv

Prepared 22-May-14  
Dilution: 1

Can pressure: -20  
Can ID: 0242

127-18-4	Tetrachloroethene	0.270	0.100	1.83	0.68		EPA TO-15L	24-May-14	KRL	1411869	X
108-90-7	Chlorobenzene	< 0.100	0.100	< 0.46	0.46		"	"	"	"	X
630-20-6	1,1,1,2-Tetrachloroethane	< 0.100	0.100	< 0.69	0.69		"	"	"	"	
100-41-4	Ethylbenzene	< 0.100	0.100	< 0.43	0.43		"	"	"	"	X
179601-23-1	m,p-Xylene	< 0.200	0.200	< 0.87	0.87		"	"	"	"	X
75-25-2	Bromoform	< 0.100	0.100	< 1.03	1.03		"	"	"	"	X
100-42-5	Styrene	< 0.100	0.100	< 0.43	0.43		"	"	"	"	X
95-47-6	o-Xylene	< 0.100	0.100	< 0.43	0.43		"	"	"	"	X
79-34-5	1,1,2,2-Tetrachloroethane	< 0.100	0.100	< 0.69	0.69		"	"	"	"	X
98-82-8	Isopropylbenzene	< 0.100	0.100	< 0.49	0.49		"	"	"	"	X
108-67-8	1,3,5-Trimethylbenzene	< 0.100	0.100	< 0.49	0.49		"	"	"	"	X
622-96-8	4-Ethyltoluene	< 0.100	0.100	< 0.49	0.49		"	"	"	"	
95-63-6	1,2,4-Trimethylbenzene	< 0.100	0.100	< 0.49	0.49		"	"	"	"	X
91-20-3	Naphthalene	< 0.500	0.500	< 2.62	2.62		"	"	"	"	X
541-73-1	1,3-Dichlorobenzene	< 0.100	0.100	< 0.60	0.60		"	"	"	"	X
100-44-7	Benzyl chloride	< 0.100	0.100	< 0.52	0.52		"	"	"	"	X
106-46-7	1,4-Dichlorobenzene	< 0.100	0.100	< 0.60	0.60		"	"	"	"	X
135-98-8	sec-Butylbenzene	< 0.100	0.100	< 0.55	0.55		"	"	"	"	
99-87-6	4-Isopropyltoluene	< 0.100	0.100	< 0.54	0.54		"	"	"	"	
95-50-1	1,2-Dichlorobenzene	< 0.100	0.100	< 0.60	0.60		"	"	"	"	X
104-51-8	n-Butylbenzene	< 0.100	0.100	< 0.55	0.55		"	"	"	"	
120-82-1	1,2,4-Trichlorobenzene	< 0.100	0.100	< 0.74	0.74		"	"	"	"	X
87-68-3	Hexachlorobutadiene	< 0.100	0.100	< 1.07	1.07		"	"	"	"	X

Surrogate recoveries:

460-00-4	4-Bromofluorobenzene	105		70-130 %			"	"	"	"	
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Sample Identification

MGU-SV-1  
SB89600-05

Client Project #  
103X9026000

Matrix  
Soil Gas

Collection Date/Time  
16-May-14 09:04

Received  
19-May-14

<u>CAS No.</u>	<u>Analyte(s)</u>	<u>Result/Units</u>	<u>*RDL</u>	<u>Result ug/m<sup>3</sup></u>	<u>*RDL</u>	<u>Flag</u>	<u>Method Ref.</u>	<u>Analyzed</u>	<u>Analyst</u>	<u>Batch</u>	<u>Cert.</u>
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**Air Quality Analyses**

Volatile Organics in Air Low Level

ppbv      Prepared 22-May-14  
Dilution: 1

Can pressure: -1  
Can ID: 0675

115-07-1	Propene	< 0.100	0.100	< 0.17	0.17		EPA TO-15L	24-May-14	KRL	1411869	
75-71-8	Dichlorodifluoromethane (Freon12)	<b>0.640</b>	0.100	<b>3.16</b>	0.49		"	"	"	"	X
74-87-3	Chloromethane	< 0.100	0.100	< 0.21	0.21		"	"	"	"	X
76-14-2	1,2-Dichlorotetrafluoroethane (Freon 114)	< 0.100	0.100	< 0.70	0.70		"	"	"	"	X
75-01-4	Vinyl chloride	< 0.100	0.100	< 0.26	0.26		"	"	"	"	X
106-99-0	1,3-Butadiene	< 0.100	0.100	< 0.22	0.22		"	"	"	"	X
74-83-9	Bromomethane	< 0.100	0.100	< 0.39	0.39		"	"	"	"	X
75-00-3	Chloroethane	< 0.100	0.100	< 0.26	0.26		"	"	"	"	X
67-64-1	Acetone	<b>18.1</b>	0.500	<b>43.01</b>	1.19		"	"	"	"	X
75-69-4	Trichlorofluoromethane (Freon 11)	<b>0.250</b>	0.100	<b>1.40</b>	0.56		"	"	"	"	X
64-17-5	Ethanol	<b>10.7</b>	0.500	<b>20.17</b>	0.94		"	"	"	"	
107-13-1	Acrylonitrile	< 0.100	0.100	< 0.22	0.22		"	"	"	"	X
75-35-4	1,1-Dichloroethene	< 0.100	0.100	< 0.40	0.40		"	"	"	"	X
75-09-2	Methylene chloride	<b>0.370</b>	0.100	<b>1.28</b>	0.35		"	"	"	"	X
76-13-1	1,1,2-Trichlorotrifluoroethane (Freon 113)	< 0.100	0.100	< 0.77	0.77		"	"	"	"	X
75-15-0	Carbon disulfide	< 0.500	0.500	< 1.56	1.56		"	"	"	"	X
156-60-5	trans-1,2-Dichloroethene	< 0.100	0.100	< 0.40	0.40		"	"	"	"	X
75-34-3	1,1-Dichloroethane	< 0.100	0.100	< 0.40	0.40		"	"	"	"	X
1634-04-4	Methyl tert-butyl ether	< 0.100	0.100	< 0.36	0.36		"	"	"	"	X
67-63-0	Isopropyl alcohol	<b>28.5</b>	0.500	<b>69.94</b>	1.23	E	"	"	"	"	X
78-93-3	2-Butanone (MEK)	<b>1.03</b>	0.100	<b>3.04</b>	0.29		"	"	"	"	X
156-59-2	cis-1,2-Dichloroethene	< 0.100	0.100	< 0.40	0.40		"	"	"	"	X
110-54-3	Hexane	<b>0.750</b>	0.500	<b>2.64</b>	1.76		"	"	"	"	X
141-78-6	Ethyl acetate	<b>2.83</b>	0.100	<b>10.20</b>	0.36		"	"	"	"	
67-66-3	Chloroform	<b>3.86</b>	0.100	<b>18.79</b>	0.49		"	"	"	"	X
109-99-9	Tetrahydrofuran	< 0.100	0.100	< 0.29	0.29		"	"	"	"	
107-06-2	1,2-Dichloroethane	< 0.100	0.100	< 0.40	0.40		"	"	"	"	X
71-55-6	1,1,1-Trichloroethane	<b>0.350</b>	0.100	<b>1.91</b>	0.55		"	"	"	"	X
71-43-2	Benzene	<b>0.280</b>	0.100	<b>0.89</b>	0.32		"	"	"	"	X
56-23-5	Carbon tetrachloride	<b>0.150</b>	0.100	<b>0.94</b>	0.63		"	"	"	"	X
110-82-7	Cyclohexane	< 0.100	0.100	< 0.34	0.34		"	"	"	"	X
78-87-5	1,2-Dichloropropane	< 0.100	0.100	< 0.46	0.46		"	"	"	"	X
75-27-4	Bromodichloromethane	<b>1.57</b>	0.100	<b>10.52</b>	0.67		"	"	"	"	X
79-01-6	Trichloroethene	< 0.100	0.100	< 0.54	0.54		"	"	"	"	X
123-91-1	1,4-Dioxane	<b>0.800</b>	0.500	<b>2.88</b>	1.80		"	"	"	"	X
142-82-5	n-Heptane	< 0.100	0.100	< 0.41	0.41		"	"	"	"	X
108-10-1	4-Methyl-2-pentanone (MIBK)	< 0.100	0.100	< 0.41	0.41		"	"	"	"	X
10061-01-5	cis-1,3-Dichloropropene	< 0.100	0.100	< 0.45	0.45		"	"	"	"	X
10061-02-6	trans-1,3-Dichloropropene	< 0.100	0.100	< 0.45	0.45		"	"	"	"	X
79-00-5	1,1,2-Trichloroethane	< 0.100	0.100	< 0.55	0.55		"	"	"	"	X
108-88-3	Toluene	<b>0.600</b>	0.100	<b>2.26</b>	0.38		"	"	"	"	X
591-78-6	2-Hexanone (MBK)	< 0.100	0.100	< 0.41	0.41		"	"	"	"	
124-48-1	Dibromochloromethane	< 0.100	0.100	< 0.85	0.85		"	"	"	"	X
106-93-4	1,2-Dibromoethane (EDB)	< 0.100	0.100	< 0.77	0.77		"	"	"	"	X

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Sample Identification

MGU-SV-1  
SB89600-05

Client Project #  
103X9026000

Matrix  
Soil Gas

Collection Date/Time  
16-May-14 09:04

Received  
19-May-14

<u>CAS No.</u>	<u>Analyte(s)</u>	<u>Result/Units</u>	<u>*RDL</u>	<u>Result ug/m<sup>3</sup></u>	<u>*RDL</u>	<u>Flag</u>	<u>Method Ref.</u>	<u>Analyzed</u>	<u>Analyst</u>	<u>Batch</u>	<u>Cert.</u>
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**Air Quality Analyses**

Volatile Organics in Air Low Level

ppbv

Prepared 22-May-14  
Dilution: 1

Can pressure: -1  
Can ID: 0675

127-18-4	Tetrachloroethene	39.3	0.100	266.50	0.68	E	EPA TO-15L	24-May-14	KRL	1411869	X
108-90-7	Chlorobenzene	< 0.100	0.100	< 0.46	0.46		"	"	"	"	X
630-20-6	1,1,1,2-Tetrachloroethane	< 0.100	0.100	< 0.69	0.69		"	"	"	"	
100-41-4	Ethylbenzene	0.120	0.100	0.52	0.43		"	"	"	"	X
179601-23-1	m,p-Xylene	0.380	0.200	1.65	0.87		"	"	"	"	X
75-25-2	Bromoform	< 0.100	0.100	< 1.03	1.03		"	"	"	"	X
100-42-5	Styrene	< 0.100	0.100	< 0.43	0.43		"	"	"	"	X
95-47-6	o-Xylene	0.130	0.100	0.56	0.43		"	"	"	"	X
79-34-5	1,1,2,2-Tetrachloroethane	< 0.100	0.100	< 0.69	0.69		"	"	"	"	X
98-82-8	Isopropylbenzene	< 0.100	0.100	< 0.49	0.49		"	"	"	"	X
108-67-8	1,3,5-Trimethylbenzene	< 0.100	0.100	< 0.49	0.49		"	"	"	"	X
622-96-8	4-Ethyltoluene	< 0.100	0.100	< 0.49	0.49		"	"	"	"	
95-63-6	1,2,4-Trimethylbenzene	0.170	0.100	0.84	0.49		"	"	"	"	X
91-20-3	Naphthalene	< 0.500	0.500	< 2.62	2.62		"	"	"	"	X
541-73-1	1,3-Dichlorobenzene	< 0.100	0.100	< 0.60	0.60		"	"	"	"	X
100-44-7	Benzyl chloride	< 0.100	0.100	< 0.52	0.52		"	"	"	"	X
106-46-7	1,4-Dichlorobenzene	< 0.100	0.100	< 0.60	0.60		"	"	"	"	X
135-98-8	sec-Butylbenzene	< 0.100	0.100	< 0.55	0.55		"	"	"	"	
99-87-6	4-Isopropyltoluene	< 0.100	0.100	< 0.54	0.54		"	"	"	"	
95-50-1	1,2-Dichlorobenzene	< 0.100	0.100	< 0.60	0.60		"	"	"	"	X
104-51-8	n-Butylbenzene	< 0.100	0.100	< 0.55	0.55		"	"	"	"	
120-82-1	1,2,4-Trichlorobenzene	< 0.100	0.100	< 0.74	0.74		"	"	"	"	X
87-68-3	Hexachlorobutadiene	< 0.100	0.100	< 1.07	1.07		"	"	"	"	X

Surrogate recoveries:

460-00-4	4-Bromofluorobenzene	101		70-130 %			"	"	"	"	
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Re-analysis of Volatile Organics in Air Low Level

Dilution: 5

GS1

67-63-0	Isopropyl alcohol	28.9	2.50	70.92	6.13	D	EPA TO-15L	27-May-14	KRL	1412033	X
127-18-4	Tetrachloroethene	34.0	0.500	230.56	3.39	D	"	"	"	"	X

Surrogate recoveries:

460-00-4	4-Bromofluorobenzene	99		70-130 %			"	"	"	"	
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Sample Identification

MGU-IA-1  
SB89600-06

Client Project #  
103X9026000

Matrix  
Indoor/Ambient Air

Collection Date/Time  
16-May-14 09:07

Received  
19-May-14

<u>CAS No.</u>	<u>Analyte(s)</u>	<u>Result/Units</u>	<u>*RDL</u>	<u>Result ug/m<sup>3</sup></u>	<u>*RDL</u>	<u>Flag</u>	<u>Method Ref.</u>	<u>Analyzed</u>	<u>Analyst</u>	<u>Batch</u>	<u>Cert.</u>
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**Air Quality Analyses**

<u>Volatile Organics in Air</u>		<u>ppbv</u>	<u>Prepared 19-May-14</u>			<u>R05</u>	<u>Can pressure: -1</u> <u>Can ID: 0280</u>				
			<u>Dilution: 5</u>				<u>EPA TO-15</u>	<u>19-May-14</u>	<u>KRL</u>	<u>1411391</u>	
115-07-1	Propene	< 2.50	2.50	< 4.30	4.30	D	"	"	"	"	X
75-71-8	Dichlorodifluoromethane (Freon12)	< 2.50	2.50	< 12.36	12.36	D	"	"	"	"	X
74-87-3	Chloromethane	< 2.50	2.50	< 5.16	5.16	D	"	"	"	"	X
76-14-2	1,2-Dichlorotetrafluoroethane (Freon 114)	< 2.50	2.50	< 17.47	17.47	D	"	"	"	"	X
75-01-4	Vinyl chloride	< 2.50	2.50	< 6.39	6.39	D	"	"	"	"	X
106-99-0	1,3-Butadiene	< 2.50	2.50	< 5.52	5.52	D	"	"	"	"	X
74-83-9	Bromomethane	< 2.50	2.50	< 9.70	9.70	D	"	"	"	"	X
75-00-3	Chloroethane	< 2.50	2.50	< 6.60	6.60	D	"	"	"	"	X
67-64-1	Acetone	22.2	2.50	52.75	5.94	D	"	"	"	"	X
75-69-4	Trichlorofluoromethane (Freon 11)	< 2.50	2.50	< 14.05	14.05	D	"	"	"	"	X
64-17-5	Ethanol	23.2	2.50	43.74	4.71	D	"	"	"	"	X
107-13-1	Acrylonitrile	< 2.50	2.50	< 5.42	5.42	D	"	"	"	"	X
75-35-4	1,1-Dichloroethene	< 2.50	2.50	< 9.92	9.92	D	"	"	"	"	X
75-09-2	Methylene chloride	10.0	2.50	34.72	8.68	D	"	"	"	"	X
76-13-1	1,1,2-Trichlorotrifluoroethane (Freon 113)	< 2.50	2.50	< 19.16	19.16	D	"	"	"	"	X
75-15-0	Carbon disulfide	< 2.50	2.50	< 7.78	7.78	D	"	"	"	"	X
156-60-5	trans-1,2-Dichloroethene	< 2.50	2.50	< 9.91	9.91	D	"	"	"	"	X
75-34-3	1,1-Dichloroethane	< 2.50	2.50	< 10.12	10.12	D	"	"	"	"	X
1634-04-4	Methyl tert-butyl ether	< 2.50	2.50	< 9.02	9.02	D	"	"	"	"	X
67-63-0	Isopropyl alcohol	< 2.50	2.50	< 6.13	6.13	D	"	"	"	"	X
78-93-3	2-Butanone (MEK)	< 2.50	2.50	< 7.37	7.37	D	"	"	"	"	X
156-59-2	cis-1,2-Dichloroethene	< 2.50	2.50	< 9.91	9.91	D	"	"	"	"	X
110-54-3	Hexane	3.40	2.50	11.99	8.81	D	"	"	"	"	X
141-78-6	Ethyl acetate	< 2.50	2.50	< 9.01	9.01	D	"	"	"	"	X
67-66-3	Chloroform	< 2.50	2.50	< 12.17	12.17	D	"	"	"	"	X
109-99-9	Tetrahydrofuran	< 2.50	2.50	< 7.37	7.37	D	"	"	"	"	X
107-06-2	1,2-Dichloroethane	< 2.50	2.50	< 10.12	10.12	D	"	"	"	"	X
71-55-6	1,1,1-Trichloroethane	< 2.50	2.50	< 13.64	13.64	D	"	"	"	"	X
71-43-2	Benzene	< 2.50	2.50	< 7.98	7.98	D	"	"	"	"	X
56-23-5	Carbon tetrachloride	< 2.50	2.50	< 15.73	15.73	D	"	"	"	"	X
110-82-7	Cyclohexane	< 2.50	2.50	< 8.61	8.61	D	"	"	"	"	X
78-87-5	1,2-Dichloropropane	< 2.50	2.50	< 11.55	11.55	D	"	"	"	"	X
75-27-4	Bromodichloromethane	< 2.50	2.50	< 16.75	16.75	D	"	"	"	"	X
79-01-6	Trichloroethene	< 2.50	2.50	< 13.44	13.44	D	"	"	"	"	X
123-91-1	1,4-Dioxane	< 2.50	2.50	< 9.00	9.00	D	"	"	"	"	X
142-82-5	n-Heptane	< 2.50	2.50	< 10.25	10.25	D	"	"	"	"	X
108-10-1	4-Methyl-2-pentanone (MIBK)	< 2.50	2.50	< 10.25	10.25	D	"	"	"	"	X
10061-01-5	cis-1,3-Dichloropropene	< 2.50	2.50	< 11.35	11.35	D	"	"	"	"	X
10061-02-6	trans-1,3-Dichloropropene	< 2.50	2.50	< 11.35	11.35	D	"	"	"	"	X
79-00-5	1,1,2-Trichloroethane	< 2.50	2.50	< 13.64	13.64	D	"	"	"	"	X
108-88-3	Toluene	< 2.50	2.50	< 9.41	9.41	D	"	"	"	"	X
591-78-6	2-Hexanone (MBK)	< 2.50	2.50	< 10.25	10.25	D	"	"	"	"	X
124-48-1	Dibromochloromethane	< 2.50	2.50	< 21.30	21.30	D	"	"	"	"	X
106-93-4	1,2-Dibromoethane (EDB)	< 2.50	2.50	< 19.21	19.21	D	"	"	"	"	X

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Sample Identification

MGU-IA-1  
SB89600-06

Client Project #  
103X9026000

Matrix  
Indoor/Ambient Air

Collection Date/Time  
16-May-14 09:07

Received  
19-May-14

<u>CAS No.</u>	<u>Analyte(s)</u>	<u>Result/Units</u>	<u>*RDL</u>	<u>Result ug/m<sup>3</sup></u>	<u>*RDL</u>	<u>Flag</u>	<u>Method Ref.</u>	<u>Analyzed</u>	<u>Analyst</u>	<u>Batch</u>	<u>Cert.</u>
<b>Air Quality Analyses</b>											
<u>Volatile Organics in Air</u>		ppbv	<u>Prepared 19-May-14</u>			R05	<u>Can pressure: -1</u>				
			<u>Dilution: 5</u>				<u>Can ID: 0280</u>				
127-18-4	Tetrachloroethene	< 2.50	2.50	< 16.95	16.95	D	EPA TO-15	19-May-14	KRL	1411391	X
108-90-7	Chlorobenzene	< 2.50	2.50	< 11.51	11.51	D	"	"	"	"	X
630-20-6	1,1,1,2-Tetrachloroethane	< 2.50	2.50	< 17.18	17.18	D	"	"	"	"	
100-41-4	Ethylbenzene	< 2.50	2.50	< 10.84	10.84	D	"	"	"	"	X
179601-23-1	m,p-Xylene	< 5.00	5.00	< 21.68	21.68	D	"	"	"	"	X
75-25-2	Bromoform	< 2.50	2.50	< 25.84	25.84	D	"	"	"	"	X
100-42-5	Styrene	< 2.50	2.50	< 10.63	10.63	D	"	"	"	"	X
95-47-6	o-Xylene	< 2.50	2.50	< 10.84	10.84	D	"	"	"	"	X
79-34-5	1,1,2,2-Tetrachloroethane	< 2.50	2.50	< 17.17	17.17	D	"	"	"	"	X
98-82-8	Isopropylbenzene	< 2.50	2.50	< 12.29	12.29	D	"	"	"	"	X
108-67-8	1,3,5-Trimethylbenzene	< 2.50	2.50	< 12.29	12.29	D	"	"	"	"	X
622-96-8	4-Ethyltoluene	< 2.50	2.50	< 12.29	12.29	D	"	"	"	"	
95-63-6	1,2,4-Trimethylbenzene	< 2.50	2.50	< 12.29	12.29	D	"	"	"	"	X
91-20-3	Naphthalene	< 2.50	2.50	< 13.09	13.09	D	"	"	"	"	X
541-73-1	1,3-Dichlorobenzene	< 2.50	2.50	< 15.03	15.03	D	"	"	"	"	X
100-44-7	Benzyl chloride	< 2.50	2.50	< 12.88	12.88	D	"	"	"	"	X
106-46-7	1,4-Dichlorobenzene	< 2.50	2.50	< 15.03	15.03	D	"	"	"	"	X
135-98-8	sec-Butylbenzene	< 2.50	2.50	< 13.72	13.72	D	"	"	"	"	
99-87-6	4-Isopropyltoluene	< 2.50	2.50	< 13.42	13.42	D	"	"	"	"	
95-50-1	1,2-Dichlorobenzene	< 2.50	2.50	< 15.03	15.03	D	"	"	"	"	X
104-51-8	n-Butylbenzene	< 2.50	2.50	< 13.72	13.72	D	"	"	"	"	
120-82-1	1,2,4-Trichlorobenzene	< 2.50	2.50	< 18.56	18.56	D	"	"	"	"	X
87-68-3	Hexachlorobutadiene	< 2.50	2.50	< 26.66	26.66	D	"	"	"	"	X
<u>Surrogate recoveries:</u>											
460-00-4	4-Bromofluorobenzene	94		70-130 %			"	"	"	"	

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Sample Identification

MGU-IA-2  
SB89600-07

Client Project #  
103X9026000

Matrix  
Indoor/Ambient Air

Collection Date/Time  
16-May-14 09:04

Received  
19-May-14

CAS No.	Analyte(s)	Result/Units	*RDL	Result ug/m <sup>3</sup>	*RDL	Flag	Method Ref.	Analyzed	Analyst	Batch	Cert.
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**Air Quality Analyses**

<u>Volatile Organics in Air</u>		ppbv	<u>Prepared 19-May-14</u>		R05	<u>Can pressure: -1</u>		<u>Regulator ID: 2975</u>			
			<u>Dilution: 5</u>								
115-07-1	Propene	< 2.50	2.50	< 4.30	4.30	D	EPA TO-15	19-May-14	KRL	1411391	
75-71-8	Dichlorodifluoromethane (Freon12)	< 2.50	2.50	< 12.36	12.36	D	"	"	"	"	X
74-87-3	Chloromethane	< 2.50	2.50	< 5.16	5.16	D	"	"	"	"	X
76-14-2	1,2-Dichlorotetrafluoroethane (Freon 114)	< 2.50	2.50	< 17.47	17.47	D	"	"	"	"	X
75-01-4	Vinyl chloride	< 2.50	2.50	< 6.39	6.39	D	"	"	"	"	X
106-99-0	1,3-Butadiene	< 2.50	2.50	< 5.52	5.52	D	"	"	"	"	X
74-83-9	Bromomethane	< 2.50	2.50	< 9.70	9.70	D	"	"	"	"	X
75-00-3	Chloroethane	< 2.50	2.50	< 6.60	6.60	D	"	"	"	"	X
67-64-1	Acetone	15.5	2.50	36.83	5.94	D	"	"	"	"	X
75-69-4	Trichlorofluoromethane (Freon 11)	< 2.50	2.50	< 14.05	14.05	D	"	"	"	"	X
64-17-5	Ethanol	23.4	2.50	44.12	4.71	D	"	"	"	"	
107-13-1	Acrylonitrile	< 2.50	2.50	< 5.42	5.42	D	"	"	"	"	X
75-35-4	1,1-Dichloroethene	< 2.50	2.50	< 9.92	9.92	D	"	"	"	"	X
75-09-2	Methylene chloride	10.4	2.50	36.11	8.68	D	"	"	"	"	X
76-13-1	1,1,2-Trichlorotrifluoroethane (Freon 113)	< 2.50	2.50	< 19.16	19.16	D	"	"	"	"	X
75-15-0	Carbon disulfide	< 2.50	2.50	< 7.78	7.78	D	"	"	"	"	X
156-60-5	trans-1,2-Dichloroethene	< 2.50	2.50	< 9.91	9.91	D	"	"	"	"	X
75-34-3	1,1-Dichloroethane	< 2.50	2.50	< 10.12	10.12	D	"	"	"	"	X
1634-04-4	Methyl tert-butyl ether	< 2.50	2.50	< 9.02	9.02	D	"	"	"	"	X
67-63-0	Isopropyl alcohol	< 2.50	2.50	< 6.13	6.13	D	"	"	"	"	X
78-93-3	2-Butanone (MEK)	< 2.50	2.50	< 7.37	7.37	D	"	"	"	"	X
156-59-2	cis-1,2-Dichloroethene	< 2.50	2.50	< 9.91	9.91	D	"	"	"	"	X
110-54-3	Hexane	3.80	2.50	13.40	8.81	D	"	"	"	"	X
141-78-6	Ethyl acetate	< 2.50	2.50	< 9.01	9.01	D	"	"	"	"	
67-66-3	Chloroform	< 2.50	2.50	< 12.17	12.17	D	"	"	"	"	X
109-99-9	Tetrahydrofuran	< 2.50	2.50	< 7.37	7.37	D	"	"	"	"	
107-06-2	1,2-Dichloroethane	< 2.50	2.50	< 10.12	10.12	D	"	"	"	"	X
71-55-6	1,1,1-Trichloroethane	< 2.50	2.50	< 13.64	13.64	D	"	"	"	"	X
71-43-2	Benzene	< 2.50	2.50	< 7.98	7.98	D	"	"	"	"	X
56-23-5	Carbon tetrachloride	< 2.50	2.50	< 15.73	15.73	D	"	"	"	"	X
110-82-7	Cyclohexane	< 2.50	2.50	< 8.61	8.61	D	"	"	"	"	X
78-87-5	1,2-Dichloropropane	< 2.50	2.50	< 11.55	11.55	D	"	"	"	"	X
75-27-4	Bromodichloromethane	< 2.50	2.50	< 16.75	16.75	D	"	"	"	"	X
79-01-6	Trichloroethene	< 2.50	2.50	< 13.44	13.44	D	"	"	"	"	X
123-91-1	1,4-Dioxane	< 2.50	2.50	< 9.00	9.00	D	"	"	"	"	X
142-82-5	n-Heptane	< 2.50	2.50	< 10.25	10.25	D	"	"	"	"	X
108-10-1	4-Methyl-2-pentanone (MIBK)	< 2.50	2.50	< 10.25	10.25	D	"	"	"	"	X
10061-01-5	cis-1,3-Dichloropropene	< 2.50	2.50	< 11.35	11.35	D	"	"	"	"	X
10061-02-6	trans-1,3-Dichloropropene	< 2.50	2.50	< 11.35	11.35	D	"	"	"	"	X
79-00-5	1,1,2-Trichloroethane	< 2.50	2.50	< 13.64	13.64	D	"	"	"	"	X
108-88-3	Toluene	< 2.50	2.50	< 9.41	9.41	D	"	"	"	"	X
591-78-6	2-Hexanone (MBK)	< 2.50	2.50	< 10.25	10.25	D	"	"	"	"	
124-48-1	Dibromochloromethane	< 2.50	2.50	< 21.30	21.30	D	"	"	"	"	X
106-93-4	1,2-Dibromoethane (EDB)	< 2.50	2.50	< 19.21	19.21	D	"	"	"	"	X

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Sample Identification

MGU-IA-2  
SB89600-07

Client Project #  
103X9026000

Matrix  
Indoor/Ambient Air

Collection Date/Time  
16-May-14 09:04

Received  
19-May-14

<u>CAS No.</u>	<u>Analyte(s)</u>	<u>Result/Units</u>	<u>*RDL</u>	<u>Result ug/m<sup>3</sup></u>	<u>*RDL</u>	<u>Flag</u>	<u>Method Ref.</u>	<u>Analyzed</u>	<u>Analyst</u>	<u>Batch</u>	<u>Cert.</u>
<b>Air Quality Analyses</b>											
<u>Volatile Organics in Air</u>		ppbv	<u>Prepared 19-May-14</u>			R05	<u>Can pressure: -1</u>		<u>Regulator ID: 2975</u>		
				<u>Dilution: 5</u>							
127-18-4	Tetrachloroethene	< 2.50	2.50	< 16.95	16.95	D	EPA TO-15	19-May-14	KRL	1411391	X
108-90-7	Chlorobenzene	< 2.50	2.50	< 11.51	11.51	D	"	"	"	"	X
630-20-6	1,1,1,2-Tetrachloroethane	< 2.50	2.50	< 17.18	17.18	D	"	"	"	"	
100-41-4	Ethylbenzene	< 2.50	2.50	< 10.84	10.84	D	"	"	"	"	X
179601-23-1	m,p-Xylene	< 5.00	5.00	< 21.68	21.68	D	"	"	"	"	X
75-25-2	Bromoform	< 2.50	2.50	< 25.84	25.84	D	"	"	"	"	X
100-42-5	Styrene	< 2.50	2.50	< 10.63	10.63	D	"	"	"	"	X
95-47-6	o-Xylene	< 2.50	2.50	< 10.84	10.84	D	"	"	"	"	X
79-34-5	1,1,2,2-Tetrachloroethane	< 2.50	2.50	< 17.17	17.17	D	"	"	"	"	X
98-82-8	Isopropylbenzene	< 2.50	2.50	< 12.29	12.29	D	"	"	"	"	X
108-67-8	1,3,5-Trimethylbenzene	< 2.50	2.50	< 12.29	12.29	D	"	"	"	"	X
622-96-8	4-Ethyltoluene	< 2.50	2.50	< 12.29	12.29	D	"	"	"	"	
95-63-6	1,2,4-Trimethylbenzene	< 2.50	2.50	< 12.29	12.29	D	"	"	"	"	X
91-20-3	Naphthalene	< 2.50	2.50	< 13.09	13.09	D	"	"	"	"	X
541-73-1	1,3-Dichlorobenzene	< 2.50	2.50	< 15.03	15.03	D	"	"	"	"	X
100-44-7	Benzyl chloride	< 2.50	2.50	< 12.88	12.88	D	"	"	"	"	X
106-46-7	1,4-Dichlorobenzene	< 2.50	2.50	< 15.03	15.03	D	"	"	"	"	X
135-98-8	sec-Butylbenzene	< 2.50	2.50	< 13.72	13.72	D	"	"	"	"	
99-87-6	4-Isopropyltoluene	< 2.50	2.50	< 13.42	13.42	D	"	"	"	"	
95-50-1	1,2-Dichlorobenzene	< 2.50	2.50	< 15.03	15.03	D	"	"	"	"	X
104-51-8	n-Butylbenzene	< 2.50	2.50	< 13.72	13.72	D	"	"	"	"	
120-82-1	1,2,4-Trichlorobenzene	< 2.50	2.50	< 18.56	18.56	D	"	"	"	"	X
87-68-3	Hexachlorobutadiene	< 2.50	2.50	< 26.66	26.66	D	"	"	"	"	X
<u>Surrogate recoveries:</u>											
460-00-4	4-Bromofluorobenzene	94		70-130 %			"	"	"	"	

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Sample Identification

MGU-SV-3  
SB89600-08

Client Project #  
103X9026000

Matrix  
Soil Gas

Collection Date/Time  
16-May-14 09:10

Received  
19-May-14

<u>CAS No.</u>	<u>Analyte(s)</u>	<u>Result/Units</u>	<u>*RDL</u>	<u>Result ug/m<sup>3</sup></u>	<u>*RDL</u>	<u>Flag</u>	<u>Method Ref.</u>	<u>Analyzed</u>	<u>Analyst</u>	<u>Batch</u>	<u>Cert.</u>
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**Air Quality Analyses**

Volatile Organics in Air Low Level

ppbv

Prepared 22-May-14  
Dilution: 1

Can pressure: -8  
Can ID: 4626

115-07-1	Propene	18.9	0.100	32.53	0.17	E	EPA TO-15L	24-May-14	KRL	1411869	
75-71-8	Dichlorodifluoromethane (Freon12)	0.630	0.100	3.12	0.49		"	"	"	"	X
74-87-3	Chloromethane	< 0.100	0.100	< 0.21	0.21		"	"	"	"	X
76-14-2	1,2-Dichlorotetrafluoroethane (Freon 114)	< 0.100	0.100	< 0.70	0.70		"	"	"	"	X
75-01-4	Vinyl chloride	< 0.100	0.100	< 0.26	0.26		"	"	"	"	X
106-99-0	1,3-Butadiene	< 0.100	0.100	< 0.22	0.22		"	"	"	"	X
74-83-9	Bromomethane	< 0.100	0.100	< 0.39	0.39		"	"	"	"	X
75-00-3	Chloroethane	< 0.100	0.100	< 0.26	0.26		"	"	"	"	X
67-64-1	Acetone	18.1	0.500	43.01	1.19		"	"	"	"	X
75-69-4	Trichlorofluoromethane (Freon 11)	0.300	0.100	1.69	0.56		"	"	"	"	X
64-17-5	Ethanol	8.46	0.500	15.95	0.94		"	"	"	"	
107-13-1	Acrylonitrile	< 0.100	0.100	< 0.22	0.22		"	"	"	"	X
75-35-4	1,1-Dichloroethene	< 0.100	0.100	< 0.40	0.40		"	"	"	"	X
75-09-2	Methylene chloride	0.210	0.100	0.73	0.35		"	"	"	"	X
76-13-1	1,1,2-Trichlorotrifluoroethane (Freon 113)	< 0.100	0.100	< 0.77	0.77		"	"	"	"	X
75-15-0	Carbon disulfide	0.720	0.500	2.24	1.56		"	"	"	"	X
156-60-5	trans-1,2-Dichloroethene	< 0.100	0.100	< 0.40	0.40		"	"	"	"	X
75-34-3	1,1-Dichloroethane	< 0.100	0.100	< 0.40	0.40		"	"	"	"	X
1634-04-4	Methyl tert-butyl ether	< 0.100	0.100	< 0.36	0.36		"	"	"	"	X
67-63-0	Isopropyl alcohol	1.42	0.500	3.48	1.23		"	"	"	"	X
78-93-3	2-Butanone (MEK)	3.34	0.100	9.85	0.29		"	"	"	"	X
156-59-2	cis-1,2-Dichloroethene	< 0.100	0.100	< 0.40	0.40		"	"	"	"	X
110-54-3	Hexane	1.22	0.500	4.30	1.76		"	"	"	"	X
141-78-6	Ethyl acetate	< 0.100	0.100	< 0.36	0.36		"	"	"	"	
67-66-3	Chloroform	< 0.100	0.100	< 0.49	0.49		"	"	"	"	X
109-99-9	Tetrahydrofuran	< 0.100	0.100	< 0.29	0.29		"	"	"	"	
107-06-2	1,2-Dichloroethane	< 0.100	0.100	< 0.40	0.40		"	"	"	"	X
71-55-6	1,1,1-Trichloroethane	0.380	0.100	2.07	0.55		"	"	"	"	X
71-43-2	Benzene	1.81	0.100	5.77	0.32		"	"	"	"	X
56-23-5	Carbon tetrachloride	< 0.100	0.100	< 0.63	0.63		"	"	"	"	X
110-82-7	Cyclohexane	0.730	0.100	2.51	0.34		"	"	"	"	X
78-87-5	1,2-Dichloropropane	< 0.100	0.100	< 0.46	0.46		"	"	"	"	X
75-27-4	Bromodichloromethane	< 0.100	0.100	< 0.67	0.67		"	"	"	"	X
79-01-6	Trichloroethene	< 0.100	0.100	< 0.54	0.54		"	"	"	"	X
123-91-1	1,4-Dioxane	< 0.500	0.500	< 1.80	1.80		"	"	"	"	X
142-82-5	n-Heptane	0.890	0.100	3.65	0.41		"	"	"	"	X
108-10-1	4-Methyl-2-pentanone (MIBK)	0.400	0.100	1.64	0.41		"	"	"	"	X
10061-01-5	cis-1,3-Dichloropropene	< 0.100	0.100	< 0.45	0.45		"	"	"	"	X
10061-02-6	trans-1,3-Dichloropropene	< 0.100	0.100	< 0.45	0.45		"	"	"	"	X
79-00-5	1,1,2-Trichloroethane	< 0.100	0.100	< 0.55	0.55		"	"	"	"	X
108-88-3	Toluene	4.99	0.100	18.78	0.38		"	"	"	"	X
591-78-6	2-Hexanone (MBK)	< 0.100	0.100	< 0.41	0.41		"	"	"	"	
124-48-1	Dibromochloromethane	< 0.100	0.100	< 0.85	0.85		"	"	"	"	X
106-93-4	1,2-Dibromoethane (EDB)	< 0.100	0.100	< 0.77	0.77		"	"	"	"	X

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Sample Identification

MGU-SV-3  
SB89600-08

Client Project #  
103X9026000

Matrix  
Soil Gas

Collection Date/Time  
16-May-14 09:10

Received  
19-May-14

<u>CAS No.</u>	<u>Analyte(s)</u>	<u>Result/Units</u>	<u>*RDL</u>	<u>Result ug/m<sup>3</sup></u>	<u>*RDL</u>	<u>Flag</u>	<u>Method Ref.</u>	<u>Analyzed</u>	<u>Analyst</u>	<u>Batch</u>	<u>Cert.</u>
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**Air Quality Analyses**

Volatile Organics in Air Low Level

		<u>ppbv</u>	<u>Prepared 22-May-14</u>				<u>Can pressure: -8</u>				
			<u>Dilution: 1</u>				<u>Can ID: 4626</u>				
127-18-4	Tetrachloroethene	45.7	0.100	309.90	0.68	E	EPA TO-15L	24-May-14	KRL	1411869	X
108-90-7	Chlorobenzene	< 0.100	0.100	< 0.46	0.46		"	"	"	"	X
630-20-6	1,1,1,2-Tetrachloroethane	< 0.100	0.100	< 0.69	0.69		"	"	"	"	
100-41-4	Ethylbenzene	1.23	0.100	5.33	0.43		"	"	"	"	X
179601-23-1	m,p-Xylene	2.26	0.200	9.80	0.87		"	"	"	"	X
75-25-2	Bromoform	< 0.100	0.100	< 1.03	1.03		"	"	"	"	X
100-42-5	Styrene	< 0.100	0.100	< 0.43	0.43		"	"	"	"	X
95-47-6	o-Xylene	0.800	0.100	3.47	0.43		"	"	"	"	X
79-34-5	1,1,2,2-Tetrachloroethane	< 0.100	0.100	< 0.69	0.69		"	"	"	"	X
98-82-8	Isopropylbenzene	0.120	0.100	0.59	0.49		"	"	"	"	X
108-67-8	1,3,5-Trimethylbenzene	< 0.100	0.100	< 0.49	0.49		"	"	"	"	X
622-96-8	4-Ethyltoluene	< 0.100	0.100	< 0.49	0.49		"	"	"	"	
95-63-6	1,2,4-Trimethylbenzene	0.120	0.100	0.59	0.49		"	"	"	"	X
91-20-3	Naphthalene	< 0.500	0.500	< 2.62	2.62		"	"	"	"	X
541-73-1	1,3-Dichlorobenzene	< 0.100	0.100	< 0.60	0.60		"	"	"	"	X
100-44-7	Benzyl chloride	< 0.100	0.100	< 0.52	0.52		"	"	"	"	X
106-46-7	1,4-Dichlorobenzene	< 0.100	0.100	< 0.60	0.60		"	"	"	"	X
135-98-8	sec-Butylbenzene	< 0.100	0.100	< 0.55	0.55		"	"	"	"	
99-87-6	4-Isopropyltoluene	< 0.100	0.100	< 0.54	0.54		"	"	"	"	
95-50-1	1,2-Dichlorobenzene	< 0.100	0.100	< 0.60	0.60		"	"	"	"	X
104-51-8	n-Butylbenzene	< 0.100	0.100	< 0.55	0.55		"	"	"	"	
120-82-1	1,2,4-Trichlorobenzene	< 0.100	0.100	< 0.74	0.74		"	"	"	"	X
87-68-3	Hexachlorobutadiene	< 0.100	0.100	< 1.07	1.07		"	"	"	"	X

Surrogate recoveries:

460-00-4	4-Bromofluorobenzene	100		70-130 %			"	"	"	"	
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Re-analysis of Volatile Organics in Air Low Level

				<u>Dilution: 5</u>							
115-07-1	Propene	15.4	0.500	26.50	0.86	D	EPA TO-15L	24-May-14	KRL	1411869	
127-18-4	Tetrachloroethene	44.8	0.500	303.80	3.39	D	"	"	"	"	X

Surrogate recoveries:

460-00-4	4-Bromofluorobenzene	98		70-130 %			"	"	"	"	
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**Air Quality Analyses - Quality Control**

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch 1411391 - General Air Prep</b>										
<u>Blank (1411391-BLK1)</u>	<u>Prepared &amp; Analyzed: 19-May-14</u>									
Propene	< 0.500		ppbv	0.500						
Dichlorodifluoromethane (Freon12)	< 0.500		ppbv	0.500						
Chloromethane	< 0.500		ppbv	0.500						
1,2-Dichlorotetrafluoroethane (Freon 114)	< 0.500		ppbv	0.500						
Vinyl chloride	< 0.500		ppbv	0.500						
1,3-Butadiene	< 0.500		ppbv	0.500						
Bromomethane	< 0.500		ppbv	0.500						
Chloroethane	< 0.500		ppbv	0.500						
Acetone	< 0.500		ppbv	0.500						
Trichlorofluoromethane (Freon 11)	< 0.500		ppbv	0.500						
Ethanol	< 0.500		ppbv	0.500						
Acrylonitrile	< 0.500		ppbv	0.500						
1,1-Dichloroethene	< 0.500		ppbv	0.500						
Methylene chloride	< 0.500		ppbv	0.500						
1,1,2-Trichlorotrifluoroethane (Freon 113)	< 0.500		ppbv	0.500						
Carbon disulfide	< 0.500		ppbv	0.500						
trans-1,2-Dichloroethene	< 0.500		ppbv	0.500						
1,1-Dichloroethane	< 0.500		ppbv	0.500						
Methyl tert-butyl ether	< 0.500		ppbv	0.500						
Isopropyl alcohol	< 0.500		ppbv	0.500						
2-Butanone (MEK)	< 0.500		ppbv	0.500						
cis-1,2-Dichloroethene	< 0.500		ppbv	0.500						
Hexane	< 0.500		ppbv	0.500						
Ethyl acetate	< 0.500		ppbv	0.500						
Chloroform	< 0.500		ppbv	0.500						
Tetrahydrofuran	< 0.500		ppbv	0.500						
1,2-Dichloroethane	< 0.500		ppbv	0.500						
1,1,1-Trichloroethane	< 0.500		ppbv	0.500						
Benzene	< 0.500		ppbv	0.500						
Carbon tetrachloride	< 0.500		ppbv	0.500						
Cyclohexane	< 0.500		ppbv	0.500						
1,2-Dichloropropane	< 0.500		ppbv	0.500						
Bromodichloromethane	< 0.500		ppbv	0.500						
Trichloroethene	< 0.500		ppbv	0.500						
1,4-Dioxane	< 0.500		ppbv	0.500						
n-Heptane	< 0.500		ppbv	0.500						
4-Methyl-2-pentanone (MIBK)	< 0.500		ppbv	0.500						
cis-1,3-Dichloropropene	< 0.500		ppbv	0.500						
trans-1,3-Dichloropropene	< 0.500		ppbv	0.500						
1,1,2-Trichloroethane	< 0.500		ppbv	0.500						
Toluene	< 0.500		ppbv	0.500						
2-Hexanone (MBK)	< 0.500		ppbv	0.500						
Dibromochloromethane	< 0.500		ppbv	0.500						
1,2-Dibromoethane (EDB)	< 0.500		ppbv	0.500						
Tetrachloroethene	< 0.500		ppbv	0.500						
Chlorobenzene	< 0.500		ppbv	0.500						
1,1,1,2-Tetrachloroethane	< 0.500		ppbv	0.500						
Ethylbenzene	< 0.500		ppbv	0.500						
m,p-Xylene	< 1.00		ppbv	1.00						
Bromoform	< 0.500		ppbv	0.500						
Styrene	< 0.500		ppbv	0.500						
o-Xylene	< 0.500		ppbv	0.500						

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**Air Quality Analyses - Quality Control**

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch 1411391 - General Air Prep</b>										
<b>Blank (1411391-BLK1)</b>					<u>Prepared &amp; Analyzed: 19-May-14</u>					
1,1,2,2-Tetrachloroethane	< 0.500		ppbv	0.500						
Isopropylbenzene	< 0.500		ppbv	0.500						
1,3,5-Trimethylbenzene	< 0.500		ppbv	0.500						
4-Ethyltoluene	< 0.500		ppbv	0.500						
1,2,4-Trimethylbenzene	< 0.500		ppbv	0.500						
Naphthalene	< 0.500		ppbv	0.500						
1,3-Dichlorobenzene	< 0.500		ppbv	0.500						
Benzyl chloride	< 0.500		ppbv	0.500						
1,4-Dichlorobenzene	< 0.500		ppbv	0.500						
sec-Butylbenzene	< 0.500		ppbv	0.500						
4-Isopropyltoluene	< 0.500		ppbv	0.500						
1,2-Dichlorobenzene	< 0.500		ppbv	0.500						
n-Butylbenzene	< 0.500		ppbv	0.500						
1,2,4-Trichlorobenzene	< 0.500		ppbv	0.500						
Hexachlorobutadiene	< 0.500		ppbv	0.500						
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>9.43</i>		<i>ppbv</i>		<i>10.0</i>		<i>94</i>	<i>70-130</i>		
<b>LCS (1411391-BS1)</b>					<u>Prepared &amp; Analyzed: 19-May-14</u>					
Propene	<b>8.50</b>		ppbv		10.0		85	70-130		
Dichlorodifluoromethane (Freon12)	<b>8.70</b>		ppbv		10.0		87	70-130		
Chloromethane	<b>9.04</b>		ppbv		10.0		90	70-130		
1,2-Dichlorotetrafluoroethane (Freon 114)	<b>9.03</b>		ppbv		10.0		90	70-130		
Vinyl chloride	<b>9.23</b>		ppbv		10.0		92	70-130		
1,3-Butadiene	<b>9.16</b>		ppbv		10.0		92	70-130		
Bromomethane	<b>9.00</b>		ppbv		10.0		90	70-130		
Chloroethane	<b>9.03</b>		ppbv		10.0		90	70-130		
Acetone	<b>9.10</b>		ppbv		10.0		91	70-130		
Trichlorofluoromethane (Freon 11)	<b>10.6</b>		ppbv		10.0		106	70-130		
Ethanol	<b>8.64</b>		ppbv		10.0		86	70-130		
Acrylonitrile	<b>9.64</b>		ppbv		10.0		96	50-150		
1,1-Dichloroethene	<b>11.0</b>		ppbv		10.0		110	70-130		
Methylene chloride	<b>10.7</b>		ppbv		10.0		107	70-130		
1,1,2-Trichlorotrifluoroethane (Freon 113)	<b>10.4</b>		ppbv		10.0		104	70-130		
Carbon disulfide	<b>8.98</b>		ppbv		10.0		90	70-130		
trans-1,2-Dichloroethene	<b>8.62</b>		ppbv		10.0		86	70-130		
1,1-Dichloroethane	<b>8.23</b>		ppbv		10.0		82	70-130		
Methyl tert-butyl ether	<b>7.98</b>		ppbv		10.0		80	70-130		
Isopropyl alcohol	<b>9.89</b>		ppbv		10.0		99	70-130		
2-Butanone (MEK)	<b>7.69</b>		ppbv		10.0		77	70-130		
cis-1,2-Dichloroethene	<b>8.30</b>		ppbv		10.0		83	70-130		
Hexane	<b>8.46</b>		ppbv		10.0		85	70-130		
Ethyl acetate	<b>8.31</b>		ppbv		10.0		83	70-130		
Chloroform	<b>8.29</b>		ppbv		10.0		83	70-130		
Tetrahydrofuran	<b>7.84</b>		ppbv		10.0		78	70-130		
1,2-Dichloroethane	<b>8.26</b>		ppbv		10.0		83	70-130		
1,1,1-Trichloroethane	<b>8.61</b>		ppbv		10.0		86	70-130		
Benzene	<b>7.84</b>		ppbv		10.0		78	70-130		
Carbon tetrachloride	<b>9.15</b>		ppbv		10.0		92	70-130		
Cyclohexane	<b>8.27</b>		ppbv		10.0		83	70-130		
1,2-Dichloropropane	<b>8.46</b>		ppbv		10.0		85	70-130		
Bromodichloromethane	<b>9.01</b>		ppbv		10.0		90	70-130		
Trichloroethene	<b>8.95</b>		ppbv		10.0		90	70-130		

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**Air Quality Analyses - Quality Control**

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch 1411391 - General Air Prep</b>										
<u>LCS (1411391-BS1)</u>					<u>Prepared &amp; Analyzed: 19-May-14</u>					
1,4-Dioxane	7.61		ppbv		10.0		76	50-150		
n-Heptane	8.81		ppbv		10.0		88	70-130		
4-Methyl-2-pentanone (MIBK)	8.72		ppbv		10.0		87	70-130		
cis-1,3-Dichloropropene	8.23		ppbv		10.0		82	70-130		
trans-1,3-Dichloropropene	7.75		ppbv		10.0		78	70-130		
1,1,2-Trichloroethane	8.44		ppbv		10.0		84	70-130		
Toluene	8.41		ppbv		10.0		84	70-130		
2-Hexanone (MBK)	7.53		ppbv		10.0		75	70-130		
Dibromochloromethane	9.74		ppbv		10.0		97	70-130		
1,2-Dibromoethane (EDB)	8.37		ppbv		10.0		84	70-130		
Tetrachloroethene	10.0		ppbv		10.0		100	70-130		
Chlorobenzene	9.20		ppbv		10.0		92	70-130		
1,1,1,2-Tetrachloroethane	10.4		ppbv		10.0		104	50-150		
Ethylbenzene	8.62		ppbv		10.0		86	70-130		
m,p-Xylene	18.6		ppbv		20.0		93	70-130		
Bromoform	10.7		ppbv		10.0		107	70-130		
Styrene	8.33		ppbv		10.0		83	70-130		
o-Xylene	9.53		ppbv		10.0		95	70-130		
1,1,2,2-Tetrachloroethane	8.88		ppbv		10.0		89	70-130		
Isopropylbenzene	9.08		ppbv		10.0		91	50-150		
1,3,5-Trimethylbenzene	9.05		ppbv		10.0		90	70-130		
4-Ethyltoluene	8.70		ppbv		10.0		87	70-130		
1,2,4-Trimethylbenzene	9.01		ppbv		10.0		90	70-130		
Naphthalene	5.54		ppbv		10.0		55	50-150		
1,3-Dichlorobenzene	9.15		ppbv		10.0		92	70-130		
Benzyl chloride	9.00		ppbv		10.0		90	70-130		
1,4-Dichlorobenzene	8.36		ppbv		10.0		84	70-130		
sec-Butylbenzene	9.37		ppbv		10.0		94	50-150		
4-Isopropyltoluene	9.62		ppbv		10.0		96	50-150		
1,2-Dichlorobenzene	9.56		ppbv		10.0		96	70-130		
n-Butylbenzene	8.71		ppbv		10.0		87	50-150		
1,2,4-Trichlorobenzene	8.68		ppbv		10.0		87	70-130		
Hexachlorobutadiene	12.4		ppbv		10.0		124	70-130		
Surrogate: 4-Bromofluorobenzene	9.21		ppbv		10.0		92	70-130		

**Batch 1411869 - General Air Prep**

Blank (1411869-BLK1)

Prepared & Analyzed: 23-May-14

Propene	< 0.100		ppbv	0.100						
Dichlorodifluoromethane (Freon12)	< 0.100		ppbv	0.100						
Chloromethane	< 0.100		ppbv	0.100						
1,2-Dichlorotetrafluoroethane (Freon 114)	< 0.100		ppbv	0.100						
Vinyl chloride	< 0.100		ppbv	0.100						
1,3-Butadiene	< 0.100		ppbv	0.100						
Bromomethane	< 0.100		ppbv	0.100						
Chloroethane	< 0.100		ppbv	0.100						
Acetone	< 0.500		ppbv	0.500						
Trichlorofluoromethane (Freon 11)	< 0.100		ppbv	0.100						
Ethanol	< 0.500		ppbv	0.500						
Acrylonitrile	< 0.100		ppbv	0.100						
1,1-Dichloroethene	< 0.100		ppbv	0.100						
Methylene chloride	< 0.100		ppbv	0.100						
1,1,2-Trichlorotrifluoroethane (Freon 113)	< 0.100		ppbv	0.100						

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**Air Quality Analyses - Quality Control**

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch 1411869 - General Air Prep</b>										
<b>Blank (1411869-BLK1)</b>						<u>Prepared &amp; Analyzed: 23-May-14</u>				
Carbon disulfide	< 0.500		ppbv	0.500						
trans-1,2-Dichloroethene	< 0.100		ppbv	0.100						
1,1-Dichloroethane	< 0.100		ppbv	0.100						
Methyl tert-butyl ether	< 0.100		ppbv	0.100						
Isopropyl alcohol	< 0.500		ppbv	0.500						
2-Butanone (MEK)	< 0.100		ppbv	0.100						
cis-1,2-Dichloroethene	< 0.100		ppbv	0.100						
Hexane	< 0.500		ppbv	0.500						
Ethyl acetate	< 0.100		ppbv	0.100						
Chloroform	< 0.100		ppbv	0.100						
Tetrahydrofuran	< 0.100		ppbv	0.100						
1,2-Dichloroethane	< 0.100		ppbv	0.100						
1,1,1-Trichloroethane	< 0.100		ppbv	0.100						
Benzene	< 0.100		ppbv	0.100						
Carbon tetrachloride	< 0.100		ppbv	0.100						
Cyclohexane	< 0.100		ppbv	0.100						
1,2-Dichloropropane	< 0.100		ppbv	0.100						
Bromodichloromethane	< 0.100		ppbv	0.100						
Trichloroethene	< 0.100		ppbv	0.100						
1,4-Dioxane	< 0.500		ppbv	0.500						
n-Heptane	< 0.100		ppbv	0.100						
4-Methyl-2-pentanone (MIBK)	< 0.100		ppbv	0.100						
cis-1,3-Dichloropropene	< 0.100		ppbv	0.100						
trans-1,3-Dichloropropene	< 0.100		ppbv	0.100						
1,1,2-Trichloroethane	< 0.100		ppbv	0.100						
Toluene	< 0.100		ppbv	0.100						
2-Hexanone (MBK)	< 0.100		ppbv	0.100						
Dibromochloromethane	< 0.100		ppbv	0.100						
1,2-Dibromoethane (EDB)	< 0.100		ppbv	0.100						
Tetrachloroethene	< 0.100		ppbv	0.100						
Chlorobenzene	< 0.100		ppbv	0.100						
1,1,1,2-Tetrachloroethane	< 0.100		ppbv	0.100						
Ethylbenzene	< 0.100		ppbv	0.100						
m,p-Xylene	< 0.200		ppbv	0.200						
Bromoform	< 0.100		ppbv	0.100						
Styrene	< 0.100		ppbv	0.100						
o-Xylene	< 0.100		ppbv	0.100						
1,1,2,2-Tetrachloroethane	< 0.100		ppbv	0.100						
Isopropylbenzene	< 0.100		ppbv	0.100						
1,3,5-Trimethylbenzene	< 0.100		ppbv	0.100						
4-Ethyltoluene	< 0.100		ppbv	0.100						
1,2,4-Trimethylbenzene	< 0.100		ppbv	0.100						
Naphthalene	< 0.500		ppbv	0.500						
1,3-Dichlorobenzene	< 0.100		ppbv	0.100						
Benzyl chloride	< 0.100		ppbv	0.100						
1,4-Dichlorobenzene	< 0.100		ppbv	0.100						
sec-Butylbenzene	< 0.100		ppbv	0.100						
4-Isopropyltoluene	< 0.100		ppbv	0.100						
1,2-Dichlorobenzene	< 0.100		ppbv	0.100						
n-Butylbenzene	< 0.100		ppbv	0.100						
1,2,4-Trichlorobenzene	< 0.100		ppbv	0.100						
Hexachlorobutadiene	< 0.100		ppbv	0.100						

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**Air Quality Analyses - Quality Control**

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch 1411869 - General Air Prep</b>										
<b>Blank (1411869-BLK1)</b>					<u>Prepared &amp; Analyzed: 23-May-14</u>					
Surrogate: 4-Bromofluorobenzene	10.1		ppbv		10.0		101	70-130		
<b>LCS (1411869-BS1)</b>					<u>Prepared &amp; Analyzed: 23-May-14</u>					
Propene	4.74		ppbv		4.00		118	70-130		
Dichlorodifluoromethane (Freon12)	4.16		ppbv		4.00		104	70-130		
Chloromethane	3.16		ppbv		4.00		79	70-130		
1,2-Dichlorotetrafluoroethane (Freon 114)	3.78		ppbv		4.00		94	70-130		
Vinyl chloride	3.59		ppbv		4.00		90	70-130		
1,3-Butadiene	3.85		ppbv		4.00		96	70-130		
Bromomethane	4.67		ppbv		4.00		117	70-130		
Chloroethane	4.48		ppbv		4.00		112	70-130		
Acetone	3.76		ppbv		4.00		94	70-130		
Trichlorofluoromethane (Freon 11)	3.96		ppbv		4.00		99	70-130		
Ethanol	3.04		ppbv		4.00		76	70-130		
Acrylonitrile	3.13		ppbv		4.00		78	50-150		
1,1-Dichloroethene	3.78		ppbv		4.00		94	70-130		
Methylene chloride	4.75		ppbv		4.00		119	70-130		
1,1,2-Trichlorotrifluoroethane (Freon 113)	3.71		ppbv		4.00		93	70-130		
Carbon disulfide	3.98		ppbv		4.00		100	70-130		
trans-1,2-Dichloroethene	3.70		ppbv		4.00		92	70-130		
1,1-Dichloroethane	3.94		ppbv		4.00		98	70-130		
Methyl tert-butyl ether	3.92		ppbv		4.00		98	70-130		
Isopropyl alcohol	4.09		ppbv		4.00		102	70-130		
2-Butanone (MEK)	4.16		ppbv		4.00		104	70-130		
cis-1,2-Dichloroethene	4.02		ppbv		4.00		100	70-130		
Hexane	3.55		ppbv		4.00		89	70-130		
Ethyl acetate	5.10		ppbv		4.00		128	70-130		
Chloroform	3.78		ppbv		4.00		94	70-130		
Tetrahydrofuran	4.41		ppbv		4.00		110	70-130		
1,2-Dichloroethane	3.90		ppbv		4.00		98	70-130		
1,1,1-Trichloroethane	3.91		ppbv		4.00		98	70-130		
Benzene	3.75		ppbv		4.00		94	70-130		
Carbon tetrachloride	4.08		ppbv		4.00		102	70-130		
Cyclohexane	3.89		ppbv		4.00		97	70-130		
1,2-Dichloropropane	4.58		ppbv		4.00		114	70-130		
Bromodichloromethane	3.90		ppbv		4.00		98	70-130		
Trichloroethene	3.69		ppbv		4.00		92	70-130		
1,4-Dioxane	4.22		ppbv		4.00		106	50-150		
n-Heptane	3.77		ppbv		4.00		94	70-130		
4-Methyl-2-pentanone (MIBK)	4.67		ppbv		4.00		117	70-130		
cis-1,3-Dichloropropene	3.97		ppbv		4.00		99	70-130		
trans-1,3-Dichloropropene	4.00		ppbv		4.00		100	70-130		
1,1,2-Trichloroethane	3.88		ppbv		4.00		97	70-130		
Toluene	3.87		ppbv		4.00		97	70-130		
2-Hexanone (MBK)	4.56		ppbv		4.00		114	70-130		
Dibromochloromethane	3.94		ppbv		4.00		98	70-130		
1,2-Dibromoethane (EDB)	3.97		ppbv		4.00		99	70-130		
Tetrachloroethene	3.73		ppbv		4.00		93	70-130		
Chlorobenzene	3.51		ppbv		4.00		88	70-130		
1,1,1,2-Tetrachloroethane	3.51		ppbv		4.00		88	50-150		
Ethylbenzene	3.75		ppbv		4.00		94	70-130		
m,p-Xylene	7.57		ppbv		8.00		95	70-130		

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**Air Quality Analyses - Quality Control**

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch 1411869 - General Air Prep</b>										
<u>LCS (1411869-BS1)</u>					<u>Prepared &amp; Analyzed: 23-May-14</u>					
Bromoform	3.73		ppbv		4.00		93	70-130		
Styrene	4.01		ppbv		4.00		100	70-130		
o-Xylene	3.87		ppbv		4.00		97	70-130		
1,1,2,2-Tetrachloroethane	3.54		ppbv		4.00		88	70-130		
Isopropylbenzene	3.29		ppbv		4.00		82	50-150		
1,3,5-Trimethylbenzene	3.83		ppbv		4.00		96	70-130		
4-Ethyltoluene	4.26		ppbv		4.00		106	70-130		
1,2,4-Trimethylbenzene	4.18		ppbv		4.00		104	70-130		
Naphthalene	3.13		ppbv		4.00		78	50-150		
1,3-Dichlorobenzene	3.73		ppbv		4.00		93	70-130		
Benzyl chloride	4.21		ppbv		4.00		105	70-130		
1,4-Dichlorobenzene	3.70		ppbv		4.00		92	70-130		
sec-Butylbenzene	3.35		ppbv		4.00		84	50-150		
4-Isopropyltoluene	3.56		ppbv		4.00		89	50-150		
1,2-Dichlorobenzene	3.79		ppbv		4.00		95	70-130		
n-Butylbenzene	3.48		ppbv		4.00		87	50-150		
1,2,4-Trichlorobenzene	5.11		ppbv		4.00		128	70-130		
Hexachlorobutadiene	4.09		ppbv		4.00		102	70-130		
Surrogate: 4-Bromofluorobenzene	9.68		ppbv		10.0		97	70-130		
<u>LCS Dup (1411869-BSD1)</u>					<u>Prepared &amp; Analyzed: 23-May-14</u>					
Propene	4.52		ppbv		4.00		113	70-130	5	30
Dichlorodifluoromethane (Freon12)	4.07		ppbv		4.00		102	70-130	2	30
Chloromethane	4.91	QR5	ppbv		4.00		123	70-130	43	30
1,2-Dichlorotetrafluoroethane (Freon 114)	3.74		ppbv		4.00		94	70-130	1	30
Vinyl chloride	3.67		ppbv		4.00		92	70-130	2	30
1,3-Butadiene	3.77		ppbv		4.00		94	70-130	2	30
Bromomethane	4.48		ppbv		4.00		112	70-130	4	30
Chloroethane	4.36		ppbv		4.00		109	70-130	3	30
Acetone	3.66		ppbv		4.00		92	70-130	3	30
Trichlorofluoromethane (Freon 11)	4.06		ppbv		4.00		102	70-130	2	30
Ethanol	2.78		ppbv		4.00		70	70-130	9	30
Acrylonitrile	3.45		ppbv		4.00		86	50-150	10	30
1,1-Dichloroethene	3.64		ppbv		4.00		91	70-130	4	30
Methylene chloride	4.39		ppbv		4.00		110	70-130	8	30
1,1,2-Trichlorotrifluoroethane (Freon 113)	3.86		ppbv		4.00		96	70-130	4	30
Carbon disulfide	4.03		ppbv		4.00		101	70-130	1	30
trans-1,2-Dichloroethene	3.77		ppbv		4.00		94	70-130	2	30
1,1-Dichloroethane	3.80		ppbv		4.00		95	70-130	4	30
Methyl tert-butyl ether	3.92		ppbv		4.00		98	70-130	0	30
Isopropyl alcohol	3.98		ppbv		4.00		100	70-130	3	30
2-Butanone (MEK)	4.04		ppbv		4.00		101	70-130	3	30
cis-1,2-Dichloroethene	4.03		ppbv		4.00		101	70-130	0.2	30
Hexane	3.45		ppbv		4.00		86	70-130	3	30
Ethyl acetate	4.59		ppbv		4.00		115	70-130	11	30
Chloroform	3.86		ppbv		4.00		96	70-130	2	30
Tetrahydrofuran	3.96		ppbv		4.00		99	70-130	11	30
1,2-Dichloroethane	4.02		ppbv		4.00		100	70-130	3	30
1,1,1-Trichloroethane	4.06		ppbv		4.00		102	70-130	4	30
Benzene	3.81		ppbv		4.00		95	70-130	2	30
Carbon tetrachloride	4.10		ppbv		4.00		102	70-130	0.5	30
Cyclohexane	3.89		ppbv		4.00		97	70-130	0	30

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**Air Quality Analyses - Quality Control**

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch 1411869 - General Air Prep</b>										
<b>LCS Dup (1411869-BSD1)</b>					<u>Prepared &amp; Analyzed: 23-May-14</u>					
1,2-Dichloropropane	4.52		ppbv		4.00		113	70-130	1	30
Bromodichloromethane	3.84		ppbv		4.00		96	70-130	2	30
Trichloroethene	3.72		ppbv		4.00		93	70-130	0.8	30
1,4-Dioxane	4.18		ppbv		4.00		104	50-150	1	30
n-Heptane	3.72		ppbv		4.00		93	70-130	1	30
4-Methyl-2-pentanone (MIBK)	4.46		ppbv		4.00		112	70-130	5	30
cis-1,3-Dichloropropene	3.97		ppbv		4.00		99	70-130	0	30
trans-1,3-Dichloropropene	4.11		ppbv		4.00		103	70-130	3	30
1,1,2-Trichloroethane	3.73		ppbv		4.00		93	70-130	4	30
Toluene	3.97		ppbv		4.00		99	70-130	3	30
2-Hexanone (MBK)	4.80		ppbv		4.00		120	70-130	5	30
Dibromochloromethane	3.92		ppbv		4.00		98	70-130	0.5	30
1,2-Dibromoethane (EDB)	3.91		ppbv		4.00		98	70-130	2	30
Tetrachloroethene	3.55		ppbv		4.00		89	70-130	5	30
Chlorobenzene	3.52		ppbv		4.00		88	70-130	0.3	30
1,1,1,2-Tetrachloroethane	3.34		ppbv		4.00		84	50-150	5	30
Ethylbenzene	3.76		ppbv		4.00		94	70-130	0.3	30
m,p-Xylene	7.77		ppbv		8.00		97	70-130	3	30
Bromoform	3.74		ppbv		4.00		94	70-130	0.3	30
Styrene	4.08		ppbv		4.00		102	70-130	2	30
o-Xylene	3.77		ppbv		4.00		94	70-130	3	30
1,1,1,2,2-Tetrachloroethane	3.67		ppbv		4.00		92	70-130	4	30
Isopropylbenzene	3.44		ppbv		4.00		86	50-150	4	30
1,3,5-Trimethylbenzene	4.18		ppbv		4.00		104	70-130	9	30
4-Ethyltoluene	4.29		ppbv		4.00		107	70-130	0.7	30
1,2,4-Trimethylbenzene	4.19		ppbv		4.00		105	70-130	0.2	30
Naphthalene	3.27		ppbv		4.00		82	50-150	4	30
1,3-Dichlorobenzene	3.70		ppbv		4.00		92	70-130	0.8	30
Benzyl chloride	4.37		ppbv		4.00		109	70-130	4	30
1,4-Dichlorobenzene	3.94		ppbv		4.00		98	70-130	6	30
sec-Butylbenzene	3.46		ppbv		4.00		86	50-150	3	30
4-Isopropyltoluene	3.70		ppbv		4.00		92	50-150	4	30
1,2-Dichlorobenzene	3.93		ppbv		4.00		98	70-130	4	30
n-Butylbenzene	3.47		ppbv		4.00		87	50-150	0.3	30
1,2,4-Trichlorobenzene	5.38	QC2	ppbv		4.00		134	70-130	5	30
Hexachlorobutadiene	4.38		ppbv		4.00		110	70-130	7	30
Surrogate: 4-Bromofluorobenzene	10.2		ppbv		10.0		102	70-130		

**Batch 1412033 - General Air Prep**

**Blank (1412033-BLK1)**

Prepared & Analyzed: 27-May-14

Propene	< 0.100		ppbv	0.100						
Dichlorodifluoromethane (Freon12)	< 0.100		ppbv	0.100						
Chloromethane	< 0.100		ppbv	0.100						
1,2-Dichlorotetrafluoroethane (Freon 114)	< 0.100		ppbv	0.100						
Vinyl chloride	< 0.100		ppbv	0.100						
1,3-Butadiene	< 0.100		ppbv	0.100						
Bromomethane	< 0.100		ppbv	0.100						
Chloroethane	< 0.100		ppbv	0.100						
Acetone	< 0.500		ppbv	0.500						
Trichlorofluoromethane (Freon 11)	< 0.100		ppbv	0.100						
Ethanol	< 0.500		ppbv	0.500						
Acrylonitrile	< 0.100		ppbv	0.100						

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**Air Quality Analyses - Quality Control**

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch 1412033 - General Air Prep</b>										
<b>Blank (1412033-BLK1)</b>						<u>Prepared &amp; Analyzed: 27-May-14</u>				
1,1-Dichloroethene	< 0.100		ppbv	0.100						
Methylene chloride	< 0.100		ppbv	0.100						
1,1,2-Trichlorotrifluoroethane (Freon 113)	< 0.100		ppbv	0.100						
Carbon disulfide	< 0.500		ppbv	0.500						
trans-1,2-Dichloroethene	< 0.100		ppbv	0.100						
1,1-Dichloroethane	< 0.100		ppbv	0.100						
Methyl tert-butyl ether	< 0.100		ppbv	0.100						
Isopropyl alcohol	< 0.500		ppbv	0.500						
2-Butanone (MEK)	< 0.100		ppbv	0.100						
cis-1,2-Dichloroethene	< 0.100		ppbv	0.100						
Hexane	< 0.500		ppbv	0.500						
Ethyl acetate	< 0.100		ppbv	0.100						
Chloroform	< 0.100		ppbv	0.100						
Tetrahydrofuran	< 0.100		ppbv	0.100						
1,2-Dichloroethane	< 0.100		ppbv	0.100						
1,1,1-Trichloroethane	< 0.100		ppbv	0.100						
Benzene	< 0.100		ppbv	0.100						
Carbon tetrachloride	< 0.100		ppbv	0.100						
Cyclohexane	< 0.100		ppbv	0.100						
1,2-Dichloropropane	< 0.100		ppbv	0.100						
Bromodichloromethane	< 0.100		ppbv	0.100						
Trichloroethene	< 0.100		ppbv	0.100						
1,4-Dioxane	< 0.500		ppbv	0.500						
n-Heptane	< 0.100		ppbv	0.100						
4-Methyl-2-pentanone (MIBK)	< 0.100		ppbv	0.100						
cis-1,3-Dichloropropene	< 0.100		ppbv	0.100						
trans-1,3-Dichloropropene	< 0.100		ppbv	0.100						
1,1,2-Trichloroethane	< 0.100		ppbv	0.100						
Toluene	< 0.100		ppbv	0.100						
2-Hexanone (MBK)	< 0.100		ppbv	0.100						
Dibromochloromethane	< 0.100		ppbv	0.100						
1,2-Dibromoethane (EDB)	< 0.100		ppbv	0.100						
Tetrachloroethene	< 0.100		ppbv	0.100						
Chlorobenzene	< 0.100		ppbv	0.100						
1,1,1,2-Tetrachloroethane	< 0.100		ppbv	0.100						
Ethylbenzene	< 0.100		ppbv	0.100						
m,p-Xylene	< 0.200		ppbv	0.200						
Bromoform	< 0.100		ppbv	0.100						
Styrene	< 0.100		ppbv	0.100						
o-Xylene	< 0.100		ppbv	0.100						
1,1,2,2-Tetrachloroethane	< 0.100		ppbv	0.100						
Isopropylbenzene	< 0.100		ppbv	0.100						
1,3,5-Trimethylbenzene	< 0.100		ppbv	0.100						
4-Ethyltoluene	< 0.100		ppbv	0.100						
1,2,4-Trimethylbenzene	< 0.100		ppbv	0.100						
Naphthalene	< 0.500		ppbv	0.500						
1,3-Dichlorobenzene	< 0.100		ppbv	0.100						
Benzyl chloride	< 0.100		ppbv	0.100						
1,4-Dichlorobenzene	< 0.100		ppbv	0.100						
sec-Butylbenzene	< 0.100		ppbv	0.100						
4-Isopropyltoluene	< 0.100		ppbv	0.100						
1,2-Dichlorobenzene	< 0.100		ppbv	0.100						

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**Air Quality Analyses - Quality Control**

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch 1412033 - General Air Prep</b>										
<b>Blank (1412033-BLK1)</b>					<u>Prepared &amp; Analyzed: 27-May-14</u>					
n-Butylbenzene	< 0.100		ppbv	0.100						
1,2,4-Trichlorobenzene	< 0.100		ppbv	0.100						
Hexachlorobutadiene	< 0.100		ppbv	0.100						
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>10.1</i>		ppbv		<i>10.0</i>		<i>101</i>	<i>70-130</i>		
<b>LCS (1412033-BS1)</b>					<u>Prepared &amp; Analyzed: 27-May-14</u>					
Propene	<b>5.23</b>	QC2	ppbv		4.00		131	70-130		
Dichlorodifluoromethane (Freon12)	<b>4.40</b>		ppbv		4.00		110	70-130		
Chloromethane	<b>3.83</b>		ppbv		4.00		96	70-130		
1,2-Dichlorotetrafluoroethane (Freon 114)	<b>3.82</b>		ppbv		4.00		96	70-130		
Vinyl chloride	<b>3.65</b>		ppbv		4.00		91	70-130		
1,3-Butadiene	<b>3.73</b>		ppbv		4.00		93	70-130		
Bromomethane	<b>4.09</b>		ppbv		4.00		102	70-130		
Chloroethane	<b>4.06</b>		ppbv		4.00		102	70-130		
Acetone	<b>4.04</b>		ppbv		4.00		101	70-130		
Trichlorofluoromethane (Freon 11)	<b>3.98</b>		ppbv		4.00		100	70-130		
Ethanol	<b>2.94</b>		ppbv		4.00		74	70-130		
Acrylonitrile	<b>3.04</b>		ppbv		4.00		76	50-150		
1,1-Dichloroethene	<b>3.63</b>		ppbv		4.00		91	70-130		
Methylene chloride	<b>4.62</b>		ppbv		4.00		116	70-130		
1,1,2-Trichlorotrifluoroethane (Freon 113)	<b>3.78</b>		ppbv		4.00		94	70-130		
Carbon disulfide	<b>3.99</b>		ppbv		4.00		100	70-130		
trans-1,2-Dichloroethene	<b>3.61</b>		ppbv		4.00		90	70-130		
1,1-Dichloroethane	<b>3.90</b>		ppbv		4.00		98	70-130		
Methyl tert-butyl ether	<b>4.26</b>		ppbv		4.00		106	70-130		
Isopropyl alcohol	<b>4.16</b>		ppbv		4.00		104	70-130		
2-Butanone (MEK)	<b>4.06</b>		ppbv		4.00		102	70-130		
cis-1,2-Dichloroethene	<b>3.95</b>		ppbv		4.00		99	70-130		
Hexane	<b>3.66</b>		ppbv		4.00		92	70-130		
Ethyl acetate	<b>5.17</b>		ppbv		4.00		129	70-130		
Chloroform	<b>3.80</b>		ppbv		4.00		95	70-130		
Tetrahydrofuran	<b>4.27</b>		ppbv		4.00		107	70-130		
1,2-Dichloroethane	<b>3.98</b>		ppbv		4.00		100	70-130		
1,1,1-Trichloroethane	<b>3.96</b>		ppbv		4.00		99	70-130		
Benzene	<b>3.64</b>		ppbv		4.00		91	70-130		
Carbon tetrachloride	<b>4.20</b>		ppbv		4.00		105	70-130		
Cyclohexane	<b>3.78</b>		ppbv		4.00		94	70-130		
1,2-Dichloropropane	<b>4.50</b>		ppbv		4.00		112	70-130		
Bromodichloromethane	<b>3.89</b>		ppbv		4.00		97	70-130		
Trichloroethene	<b>3.73</b>		ppbv		4.00		93	70-130		
1,4-Dioxane	<b>3.92</b>		ppbv		4.00		98	50-150		
n-Heptane	<b>3.85</b>		ppbv		4.00		96	70-130		
4-Methyl-2-pentanone (MIBK)	<b>4.76</b>		ppbv		4.00		119	70-130		
cis-1,3-Dichloropropene	<b>4.02</b>		ppbv		4.00		100	70-130		
trans-1,3-Dichloropropene	<b>4.33</b>		ppbv		4.00		108	70-130		
1,1,2-Trichloroethane	<b>4.03</b>		ppbv		4.00		101	70-130		
Toluene	<b>4.03</b>		ppbv		4.00		101	70-130		
2-Hexanone (MBK)	<b>4.69</b>		ppbv		4.00		117	70-130		
Dibromochloromethane	<b>3.96</b>		ppbv		4.00		99	70-130		
1,2-Dibromoethane (EDB)	<b>3.87</b>		ppbv		4.00		97	70-130		
Tetrachloroethene	<b>3.50</b>		ppbv		4.00		88	70-130		
Chlorobenzene	<b>3.64</b>		ppbv		4.00		91	70-130		

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**Air Quality Analyses - Quality Control**

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch 1412033 - General Air Prep</b>										
<u>LCS (1412033-BS1)</u>								<u>Prepared &amp; Analyzed: 27-May-14</u>		
1,1,1,2-Tetrachloroethane	3.64		ppbv		4.00		91	50-150		
Ethylbenzene	3.77		ppbv		4.00		94	70-130		
m,p-Xylene	7.79		ppbv		8.00		97	70-130		
Bromoform	3.79		ppbv		4.00		95	70-130		
Styrene	4.14		ppbv		4.00		104	70-130		
o-Xylene	3.77		ppbv		4.00		94	70-130		
1,1,2,2-Tetrachloroethane	3.71		ppbv		4.00		93	70-130		
Isopropylbenzene	3.40		ppbv		4.00		85	50-150		
1,3,5-Trimethylbenzene	4.05		ppbv		4.00		101	70-130		
4-Ethyltoluene	4.21		ppbv		4.00		105	70-130		
1,2,4-Trimethylbenzene	4.08		ppbv		4.00		102	70-130		
Naphthalene	3.42		ppbv		4.00		86	50-150		
1,3-Dichlorobenzene	3.60		ppbv		4.00		90	70-130		
Benzyl chloride	4.53		ppbv		4.00		113	70-130		
1,4-Dichlorobenzene	3.69		ppbv		4.00		92	70-130		
sec-Butylbenzene	3.47		ppbv		4.00		87	50-150		
4-Isopropyltoluene	3.69		ppbv		4.00		92	50-150		
1,2-Dichlorobenzene	3.91		ppbv		4.00		98	70-130		
n-Butylbenzene	3.54		ppbv		4.00		88	50-150		
1,2,4-Trichlorobenzene	5.31	QC2	ppbv		4.00		133	70-130		
Hexachlorobutadiene	4.44		ppbv		4.00		111	70-130		
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>10.0</i>		<i>ppbv</i>		<i>10.0</i>		<i>100</i>	<i>70-130</i>		

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## Certificate of Analysis

**Container Type:** Summa canister 6 liter

**Date of Analysis:** 5/6/2014

**Canister ID:** 0207

**Analyst's Initials:** KRL

**The sampling device detailed above has been tested and is certified to the limits for the target compounds as listed below.**

<i>Analyte</i>	<i>Quantitation Limit (ppbv)</i>	<i>Analyte</i>	<i>Quantitation Limit (ppbv)</i>
Acetone	<0.5	Ethanol	<0.5
Acrylonitrile	<0.1	4-Isopropyl Toluene	<0.5
Benzene	<0.1	Ethyl acetate	<0.1
Benzyl chloride	<0.1	Ethylbenzene	<0.1
Bromodichloromethane	<0.1	4-Ethyltoluene	<0.1
Bromoform	<0.1	n-Heptane	<0.1
Bromomethane	<0.1	Hexachlorobutadiene	<0.1
1,3-Butadiene	<0.1	Hexane	<0.1
2-Butanone (MEK)	<0.1	2-Hexanone (MBK)	<0.1
Carbon disulfide	<0.5	Isopropyl alcohol	<0.5
Carbon tetrachloride	<0.1	4-Methyl-2-pentanone (MIBK)	<0.1
Chlorobenzene	<0.1	Methyl tert-butyl ether	<0.1
Chloroethane	<0.1	Methylene chloride	<0.1
1,4-Dioxane	<0.1	Naphthalene	<0.5
n-Butylbenzene	<0.1	1,1,1,2-Tetrachloroethane	<0.1
Chloroform	<0.1	Propene	<0.1
Chloromethane	<0.1	Styrene	<0.1
Cyclohexane	<0.1	1,1,2,2-Tetrachloroethane	<0.1
Dibromochloromethane	<0.1	Tetrachloroethene	<0.1
1,2-Dibromoethane (EDB)	<0.1	Tetrahydrofuran	<0.1
1,2-Dichlorobenzene	<0.1	Toluene	<0.1
1,3-Dichlorobenzene	<0.1	1,2,4-Trichlorobenzene	<0.1
1,4-Dichlorobenzene	<0.1	1,1,1-Trichloroethane	<0.1
Dichlorodifluoromethane (Freon12)	<0.1	1,1,2-Trichloroethane	<0.1
1,1-Dichloroethane	<0.1	Trichloroethene	<0.1
1,2-Dichloroethane	<0.1	1,1,2-Trichlorotrifluoroethane (Freon 113)	<0.1
1,1-Dichloroethene	<0.1	Trichlorofluoromethane (Freon 11)	<0.1
cis-1,2-Dichloroethene	<0.1	1,2,4-Trimethylbenzene	<0.1
trans-1,2-Dichloroethene	<0.1	1,3,5-Trimethylbenzene	<0.1
1,2-Dichloropropane	<0.1	Vinyl chloride	<0.1
cis-1,3-Dichloropropene	<0.1	m,p-Xylene	<0.1
trans-1,3-Dichloropropene	<0.1	o-Xylene	<0.1
1,2-Dichlorotetrafluoroethane (Freon 114)	<0.1	sec-Butylbenzene	<0.1
Isopropylbenzene	<0.1		

**This certification applies to the following sampling devices:**

0207

## Certificate of Analysis

**Container Type:** Summa canister 6 liter

**Date of Analysis:** 5/6/2014

**Canister ID:** 0242

**Analyst's Initials:** KRL

**The sampling device detailed above has been tested and is certified to the limits for the target compounds as listed below.**

<i>Analyte</i>	<i>Quantitation Limit (ppbv)</i>	<i>Analyte</i>	<i>Quantitation Limit (ppbv)</i>
Acetone	<0.5	Ethanol	<0.5
Acrylonitrile	<0.1	4-Isopropyl Toluene	<0.5
Benzene	<0.1	Ethyl acetate	<0.1
Benzyl chloride	<0.1	Ethylbenzene	<0.1
Bromodichloromethane	<0.1	4-Ethyltoluene	<0.1
Bromoform	<0.1	n-Heptane	<0.1
Bromomethane	<0.1	Hexachlorobutadiene	<0.1
1,3-Butadiene	<0.1	Hexane	<0.1
2-Butanone (MEK)	<0.1	2-Hexanone (MBK)	<0.1
Carbon disulfide	<0.5	Isopropyl alcohol	<0.5
Carbon tetrachloride	<0.1	4-Methyl-2-pentanone (MIBK)	<0.1
Chlorobenzene	<0.1	Methyl tert-butyl ether	<0.1
Chloroethane	<0.1	Methylene chloride	<0.1
1,4-Dioxane	<0.1	Naphthalene	<0.5
n-Butylbenzene	<0.1	1,1,1,2-Tetrachloroethane	<0.1
Chloroform	<0.1	Propene	<0.1
Chloromethane	<0.1	Styrene	<0.1
Cyclohexane	<0.1	1,1,2,2-Tetrachloroethane	<0.1
Dibromochloromethane	<0.1	Tetrachloroethene	<0.1
1,2-Dibromoethane (EDB)	<0.1	Tetrahydrofuran	<0.1
1,2-Dichlorobenzene	<0.1	Toluene	<0.1
1,3-Dichlorobenzene	<0.1	1,2,4-Trichlorobenzene	<0.1
1,4-Dichlorobenzene	<0.1	1,1,1-Trichloroethane	<0.1
Dichlorodifluoromethane (Freon12)	<0.1	1,1,2-Trichloroethane	<0.1
1,1-Dichloroethane	<0.1	Trichloroethene	<0.1
1,2-Dichloroethane	<0.1	1,1,2-Trichlorotrifluoroethane (Freon 113)	<0.1
1,1-Dichloroethene	<0.1	Trichlorofluoromethane (Freon 11)	<0.1
cis-1,2-Dichloroethene	<0.1	1,2,4-Trimethylbenzene	<0.1
trans-1,2-Dichloroethene	<0.1	1,3,5-Trimethylbenzene	<0.1
1,2-Dichloropropane	<0.1	Vinyl chloride	<0.1
cis-1,3-Dichloropropene	<0.1	m,p-Xylene	<0.1
trans-1,3-Dichloropropene	<0.1	o-Xylene	<0.1
1,2-Dichlorotetrafluoroethane (Freon 114)	<0.1	sec-Butylbenzene	<0.1
Isopropylbenzene	<0.1		

**This certification applies to the following sampling devices:**

0242

## Certificate of Analysis

**Container Type:** Summa canister 6 liter

**Date of Analysis:** 5/6/2014

**Canister ID:** 0274

**Analyst's Initials:** KRL

**The sampling device detailed above has been tested and is certified to the limits for the target compounds as listed below.**

<i>Analyte</i>	<i>Quantitation Limit (ppbv)</i>	<i>Analyte</i>	<i>Quantitation Limit (ppbv)</i>
Acetone	<0.5	Ethanol	<0.5
Acrylonitrile	<0.1	4-Isopropyl Toluene	<0.5
Benzene	<0.1	Ethyl acetate	<0.1
Benzyl chloride	<0.1	Ethylbenzene	<0.1
Bromodichloromethane	<0.1	4-Ethyltoluene	<0.1
Bromoform	<0.1	n-Heptane	<0.1
Bromomethane	<0.1	Hexachlorobutadiene	<0.1
1,3-Butadiene	<0.1	Hexane	<0.1
2-Butanone (MEK)	<0.1	2-Hexanone (MBK)	<0.1
Carbon disulfide	<0.5	Isopropyl alcohol	<0.5
Carbon tetrachloride	<0.1	4-Methyl-2-pentanone (MIBK)	<0.1
Chlorobenzene	<0.1	Methyl tert-butyl ether	<0.1
Chloroethane	<0.1	Methylene chloride	<0.1
1,4-Dioxane	<0.1	Naphthalene	<0.5
n-Butylbenzene	<0.1	1,1,1,2-Tetrachloroethane	<0.1
Chloroform	<0.1	Propene	<0.1
Chloromethane	<0.1	Styrene	<0.1
Cyclohexane	<0.1	1,1,2,2-Tetrachloroethane	<0.1
Dibromochloromethane	<0.1	Tetrachloroethene	<0.1
1,2-Dibromoethane (EDB)	<0.1	Tetrahydrofuran	<0.1
1,2-Dichlorobenzene	<0.1	Toluene	<0.1
1,3-Dichlorobenzene	<0.1	1,2,4-Trichlorobenzene	<0.1
1,4-Dichlorobenzene	<0.1	1,1,1-Trichloroethane	<0.1
Dichlorodifluoromethane (Freon12)	<0.1	1,1,2-Trichloroethane	<0.1
1,1-Dichloroethane	<0.1	Trichloroethene	<0.1
1,2-Dichloroethane	<0.1	1,1,2-Trichlorotrifluoroethane (Freon 113)	<0.1
1,1-Dichloroethene	<0.1	Trichlorofluoromethane (Freon 11)	<0.1
cis-1,2-Dichloroethene	<0.1	1,2,4-Trimethylbenzene	<0.1
trans-1,2-Dichloroethene	<0.1	1,3,5-Trimethylbenzene	<0.1
1,2-Dichloropropane	<0.1	Vinyl chloride	<0.1
cis-1,3-Dichloropropene	<0.1	m,p-Xylene	<0.1
trans-1,3-Dichloropropene	<0.1	o-Xylene	<0.1
1,2-Dichlorotetrafluoroethane (Freon 114)	<0.1	sec-Butylbenzene	<0.1
Isopropylbenzene	<0.1		

**This certification applies to the following sampling devices:**

0274

## Certificate of Analysis

**Container Type:** Summa canister 6 liter

**Date of Analysis:** 5/6/2014

**Canister ID:** 0280

**Analyst's Initials:** KRL

**The sampling device detailed above has been tested and is certified to the limits for the target compounds as listed below.**

<i>Analyte</i>	<i>Quantitation Limit (ppbv)</i>	<i>Analyte</i>	<i>Quantitation Limit (ppbv)</i>
Acetone	<0.5	Ethanol	<0.5
Acrylonitrile	<0.1	4-Isopropyl Toluene	<0.5
Benzene	<0.1	Ethyl acetate	<0.1
Benzyl chloride	<0.1	Ethylbenzene	<0.1
Bromodichloromethane	<0.1	4-Ethyltoluene	<0.1
Bromoform	<0.1	n-Heptane	<0.1
Bromomethane	<0.1	Hexachlorobutadiene	<0.1
1,3-Butadiene	<0.1	Hexane	<0.1
2-Butanone (MEK)	<0.1	2-Hexanone (MBK)	<0.1
Carbon disulfide	<0.5	Isopropyl alcohol	<0.5
Carbon tetrachloride	<0.1	4-Methyl-2-pentanone (MIBK)	<0.1
Chlorobenzene	<0.1	Methyl tert-butyl ether	<0.1
Chloroethane	<0.1	Methylene chloride	<0.1
1,4-Dioxane	<0.1	Naphthalene	<0.5
n-Butylbenzene	<0.1	1,1,1,2-Tetrachloroethane	<0.1
Chloroform	<0.1	Propene	<0.1
Chloromethane	<0.1	Styrene	<0.1
Cyclohexane	<0.1	1,1,2,2-Tetrachloroethane	<0.1
Dibromochloromethane	<0.1	Tetrachloroethene	<0.1
1,2-Dibromoethane (EDB)	<0.1	Tetrahydrofuran	<0.1
1,2-Dichlorobenzene	<0.1	Toluene	<0.1
1,3-Dichlorobenzene	<0.1	1,2,4-Trichlorobenzene	<0.1
1,4-Dichlorobenzene	<0.1	1,1,1-Trichloroethane	<0.1
Dichlorodifluoromethane (Freon12)	<0.1	1,1,2-Trichloroethane	<0.1
1,1-Dichloroethane	<0.1	Trichloroethene	<0.1
1,2-Dichloroethane	<0.1	1,1,2-Trichlorotrifluoroethane (Freon 113)	<0.1
1,1-Dichloroethene	<0.1	Trichlorofluoromethane (Freon 11)	<0.1
cis-1,2-Dichloroethene	<0.1	1,2,4-Trimethylbenzene	<0.1
trans-1,2-Dichloroethene	<0.1	1,3,5-Trimethylbenzene	<0.1
1,2-Dichloropropane	<0.1	Vinyl chloride	<0.1
cis-1,3-Dichloropropene	<0.1	m,p-Xylene	<0.1
trans-1,3-Dichloropropene	<0.1	o-Xylene	<0.1
1,2-Dichlorotetrafluoroethane (Freon 114)	<0.1	sec-Butylbenzene	<0.1
Isopropylbenzene	<0.1		

**This certification applies to the following sampling devices:**

0280

# Certificate of Analysis

**Container Type:** Summa canister 6 liter

**Date of Analysis:** 4/16/2014

**Canister ID:** 0488

**Analyst's Initials:** BRF

**The sampling device detailed above has been tested and is certified to the limits for the target compounds as listed below.**

<i>Analyte</i>	<i>Quantitation Limit (ppbv)</i>	<i>Analyte</i>	<i>Quantitation Limit (ppbv)</i>
Acetone	<0.5	Ethanol	<0.5
Acrylonitrile	<0.1	4-Isopropyl Toluene	<0.5
Benzene	<0.1	Ethyl acetate	<0.1
Benzyl chloride	<0.1	Ethylbenzene	<0.1
Bromodichloromethane	<0.1	4-Ethyltoluene	<0.1
Bromoform	<0.1	n-Heptane	<0.1
Bromomethane	<0.1	Hexachlorobutadiene	<0.1
1,3-Butadiene	<0.1	Hexane	<0.1
2-Butanone (MEK)	<0.1	2-Hexanone (MBK)	<0.1
Carbon disulfide	<0.5	Isopropyl alcohol	<0.5
Carbon tetrachloride	<0.1	4-Methyl-2-pentanone (MIBK)	<0.1
Chlorobenzene	<0.1	Methyl tert-butyl ether	<0.1
Chloroethane	<0.1	Methylene chloride	<0.1
1,4-Dioxane	<0.1	Naphthalene	<0.5
n-Butylbenzene	<0.1	1,1,1,2-Tetrachloroethane	<0.1
Chloroform	<0.1	Propene	<0.1
Chloromethane	<0.1	Styrene	<0.1
Cyclohexane	<0.1	1,1,2,2-Tetrachloroethane	<0.1
Dibromochloromethane	<0.1	Tetrachloroethene	<0.1
1,2-Dibromoethane (EDB)	<0.1	Tetrahydrofuran	<0.1
1,2-Dichlorobenzene	<0.1	Toluene	<0.1
1,3-Dichlorobenzene	<0.1	1,2,4-Trichlorobenzene	<0.1
1,4-Dichlorobenzene	<0.1	1,1,1-Trichloroethane	<0.1
Dichlorodifluoromethane (Freon12)	<0.1	1,1,2-Trichloroethane	<0.1
1,1-Dichloroethane	<0.1	Trichloroethene	<0.1
1,2-Dichloroethane	<0.1	1,1,2-Trichlorotrifluoroethane (Freon 113)	<0.1
1,1-Dichloroethene	<0.1	Trichlorofluoromethane (Freon 11)	<0.1
cis-1,2-Dichloroethene	<0.1	1,2,4-Trimethylbenzene	<0.1
trans-1,2-Dichloroethene	<0.1	1,3,5-Trimethylbenzene	<0.1
1,2-Dichloropropane	<0.1	Vinyl chloride	<0.1
cis-1,3-Dichloropropene	<0.1	m,p-Xylene	<0.1
trans-1,3-Dichloropropene	<0.1	o-Xylene	<0.1
1,2-Dichlorotetrafluoroethane (Freon 114)	<0.1	sec-Butylbenzene	<0.1
Isopropylbenzene	<0.1		

**This certification applies to the following sampling devices:**

0488

## Certificate of Analysis

**Container Type:** Summa canister 6 liter

**Date of Analysis:** 5/6/2014

**Canister ID:** 0666

**Analyst's Initials:** KRL

**The sampling device detailed above has been tested and is certified to the limits for the target compounds as listed below.**

<i>Analyte</i>	<i>Quantitation Limit (ppbv)</i>	<i>Analyte</i>	<i>Quantitation Limit (ppbv)</i>
Acetone	<0.5	Ethanol	<0.5
Acrylonitrile	<0.1	4-Isopropyl Toluene	<0.5
Benzene	<0.1	Ethyl acetate	<0.1
Benzyl chloride	<0.1	Ethylbenzene	<0.1
Bromodichloromethane	<0.1	4-Ethyltoluene	<0.1
Bromoform	<0.1	n-Heptane	<0.1
Bromomethane	<0.1	Hexachlorobutadiene	<0.1
1,3-Butadiene	<0.1	Hexane	<0.1
2-Butanone (MEK)	<0.1	2-Hexanone (MBK)	<0.1
Carbon disulfide	<0.5	Isopropyl alcohol	<0.5
Carbon tetrachloride	<0.1	4-Methyl-2-pentanone (MIBK)	<0.1
Chlorobenzene	<0.1	Methyl tert-butyl ether	<0.1
Chloroethane	<0.1	Methylene chloride	<0.1
1,4-Dioxane	<0.1	Naphthalene	<0.5
n-Butylbenzene	<0.1	1,1,1,2-Tetrachloroethane	<0.1
Chloroform	<0.1	Propene	<0.1
Chloromethane	<0.1	Styrene	<0.1
Cyclohexane	<0.1	1,1,2,2-Tetrachloroethane	<0.1
Dibromochloromethane	<0.1	Tetrachloroethene	<0.1
1,2-Dibromoethane (EDB)	<0.1	Tetrahydrofuran	<0.1
1,2-Dichlorobenzene	<0.1	Toluene	<0.1
1,3-Dichlorobenzene	<0.1	1,2,4-Trichlorobenzene	<0.1
1,4-Dichlorobenzene	<0.1	1,1,1-Trichloroethane	<0.1
Dichlorodifluoromethane (Freon12)	<0.1	1,1,2-Trichloroethane	<0.1
1,1-Dichloroethane	<0.1	Trichloroethene	<0.1
1,2-Dichloroethane	<0.1	1,1,2-Trichlorotrifluoroethane (Freon 113)	<0.1
1,1-Dichloroethene	<0.1	Trichlorofluoromethane (Freon 11)	<0.1
cis-1,2-Dichloroethene	<0.1	1,2,4-Trimethylbenzene	<0.1
trans-1,2-Dichloroethene	<0.1	1,3,5-Trimethylbenzene	<0.1
1,2-Dichloropropane	<0.1	Vinyl chloride	<0.1
cis-1,3-Dichloropropene	<0.1	m,p-Xylene	<0.1
trans-1,3-Dichloropropene	<0.1	o-Xylene	<0.1
1,2-Dichlorotetrafluoroethane (Freon 114)	<0.1	sec-Butylbenzene	<0.1
Isopropylbenzene	<0.1		

**This certification applies to the following sampling devices:**

0666

## Certificate of Analysis

**Container Type:** Summa canister 6 liter

**Date of Analysis:** 4/16/2014

**Canister ID:** 0675

**Analyst's Initials:** BRF

**The sampling device detailed above has been tested and is certified to the limits for the target compounds as listed below.**

<i>Analyte</i>	<i>Quantitation Limit (ppbv)</i>	<i>Analyte</i>	<i>Quantitation Limit (ppbv)</i>
Acetone	<0.5	Ethanol	<0.5
Acrylonitrile	<0.1	4-Isopropyl Toluene	<0.5
Benzene	<0.1	Ethyl acetate	<0.1
Benzyl chloride	<0.1	Ethylbenzene	<0.1
Bromodichloromethane	<0.1	4-Ethyltoluene	<0.1
Bromoform	<0.1	n-Heptane	<0.1
Bromomethane	<0.1	Hexachlorobutadiene	<0.1
1,3-Butadiene	<0.1	Hexane	<0.1
2-Butanone (MEK)	<0.1	2-Hexanone (MBK)	<0.1
Carbon disulfide	<0.5	Isopropyl alcohol	<0.5
Carbon tetrachloride	<0.1	4-Methyl-2-pentanone (MIBK)	<0.1
Chlorobenzene	<0.1	Methyl tert-butyl ether	<0.1
Chloroethane	<0.1	Methylene chloride	<0.1
1,4-Dioxane	<0.1	Naphthalene	<0.5
n-Butylbenzene	<0.1	1,1,1,2-Tetrachloroethane	<0.1
Chloroform	<0.1	Propene	<0.1
Chloromethane	<0.1	Styrene	<0.1
Cyclohexane	<0.1	1,1,2,2-Tetrachloroethane	<0.1
Dibromochloromethane	<0.1	Tetrachloroethene	<0.1
1,2-Dibromoethane (EDB)	<0.1	Tetrahydrofuran	<0.1
1,2-Dichlorobenzene	<0.1	Toluene	<0.1
1,3-Dichlorobenzene	<0.1	1,2,4-Trichlorobenzene	<0.1
1,4-Dichlorobenzene	<0.1	1,1,1-Trichloroethane	<0.1
Dichlorodifluoromethane (Freon12)	<0.1	1,1,2-Trichloroethane	<0.1
1,1-Dichloroethane	<0.1	Trichloroethene	<0.1
1,2-Dichloroethane	<0.1	1,1,2-Trichlorotrifluoroethane (Freon 113)	<0.1
1,1-Dichloroethene	<0.1	Trichlorofluoromethane (Freon 11)	<0.1
cis-1,2-Dichloroethene	<0.1	1,2,4-Trimethylbenzene	<0.1
trans-1,2-Dichloroethene	<0.1	1,3,5-Trimethylbenzene	<0.1
1,2-Dichloropropane	<0.1	Vinyl chloride	<0.1
cis-1,3-Dichloropropene	<0.1	m,p-Xylene	<0.1
trans-1,3-Dichloropropene	<0.1	o-Xylene	<0.1
1,2-Dichlorotetrafluoroethane (Freon 114)	<0.1	sec-Butylbenzene	<0.1
Isopropylbenzene	<0.1		

**This certification applies to the following sampling devices:**

0675

## Certificate of Analysis

**Container Type:** Summa canister 6 liter

**Date of Analysis:** 5/6/2014

**Canister ID:** 4626

**Analyst's Initials:** KRL

**The sampling device detailed above has been tested and is certified to the limits for the target compounds as listed below.**

<i>Analyte</i>	<i>Quantitation Limit (ppbv)</i>	<i>Analyte</i>	<i>Quantitation Limit (ppbv)</i>
Acetone	<0.5	Ethanol	<0.5
Acrylonitrile	<0.1	4-Isopropyl Toluene	<0.5
Benzene	<0.1	Ethyl acetate	<0.1
Benzyl chloride	<0.1	Ethylbenzene	<0.1
Bromodichloromethane	<0.1	4-Ethyltoluene	<0.1
Bromoform	<0.1	n-Heptane	<0.1
Bromomethane	<0.1	Hexachlorobutadiene	<0.1
1,3-Butadiene	<0.1	Hexane	<0.1
2-Butanone (MEK)	<0.1	2-Hexanone (MBK)	<0.1
Carbon disulfide	<0.5	Isopropyl alcohol	<0.5
Carbon tetrachloride	<0.1	4-Methyl-2-pentanone (MIBK)	<0.1
Chlorobenzene	<0.1	Methyl tert-butyl ether	<0.1
Chloroethane	<0.1	Methylene chloride	<0.1
1,4-Dioxane	<0.1	Naphthalene	<0.5
n-Butylbenzene	<0.1	1,1,1,2-Tetrachloroethane	<0.1
Chloroform	<0.1	Propene	<0.1
Chloromethane	<0.1	Styrene	<0.1
Cyclohexane	<0.1	1,1,2,2-Tetrachloroethane	<0.1
Dibromochloromethane	<0.1	Tetrachloroethene	<0.1
1,2-Dibromoethane (EDB)	<0.1	Tetrahydrofuran	<0.1
1,2-Dichlorobenzene	<0.1	Toluene	<0.1
1,3-Dichlorobenzene	<0.1	1,2,4-Trichlorobenzene	<0.1
1,4-Dichlorobenzene	<0.1	1,1,1-Trichloroethane	<0.1
Dichlorodifluoromethane (Freon12)	<0.1	1,1,2-Trichloroethane	<0.1
1,1-Dichloroethane	<0.1	Trichloroethene	<0.1
1,2-Dichloroethane	<0.1	1,1,2-Trichlorotrifluoroethane (Freon 113)	<0.1
1,1-Dichloroethene	<0.1	Trichlorofluoromethane (Freon 11)	<0.1
cis-1,2-Dichloroethene	<0.1	1,2,4-Trimethylbenzene	<0.1
trans-1,2-Dichloroethene	<0.1	1,3,5-Trimethylbenzene	<0.1
1,2-Dichloropropane	<0.1	Vinyl chloride	<0.1
cis-1,3-Dichloropropene	<0.1	m,p-Xylene	<0.1
trans-1,3-Dichloropropene	<0.1	o-Xylene	<0.1
1,2-Dichlorotetrafluoroethane (Freon 114)	<0.1	sec-Butylbenzene	<0.1
Isopropylbenzene	<0.1		

**This certification applies to the following sampling devices:**

4626

## Notes and Definitions

CRL5	Low level calibration check failed, reportable sample concentrations may be biased high.
D	Data reported from a dilution
E	This flag indicates the concentration for this analyte is an estimated value due to exceeding the calibration range or interferences resulting in a biased final concentration.
GS1	Sample dilution required for high concentration of target analytes to be within the instrument calibration range.
QC2	Analyte out of acceptance range in QC spike but no reportable concentration present in sample.
QR5	RPD out of acceptance range.
R05	Elevated Reporting Limits due to the presence of high levels of non-target analytes; sample may not meet client requested reporting limit for this reason.
dry	Sample results reported on a dry weight basis
NR	Not Reported
RPD	Relative Percent Difference

Laboratory Control Sample (LCS): A known matrix spiked with compound(s) representative of the target analytes, which is used to document laboratory performance.

Matrix Duplicate: An intra-laboratory split sample which is used to document the precision of a method in a given sample matrix.

Matrix Spike: An aliquot of a sample spiked with a known concentration of target analyte(s). The spiking occurs prior to sample preparation and analysis. A matrix spike is used to document the bias of a method in a given sample matrix.

Method Blank: An analyte-free matrix to which all reagents are added in the same volumes or proportions as used in sample processing. The method blank should be carried through the complete sample preparation and analytical procedure. The method blank is used to document contamination resulting from the analytical process.

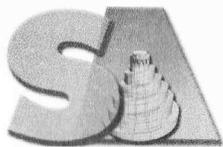
Method Detection Limit (MDL): The minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero and is determined from analysis of a sample in a given matrix type containing the analyte.

Reportable Detection Limit (RDL): The lowest concentration that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions. For many analytes the RDL analyte concentration is selected as the lowest non-zero standard in the calibration curve. While the RDL is approximately 5 to 10 times the MDL, the RDL for each sample takes into account the sample volume/weight, extract/digestate volume, cleanup procedures and, if applicable, dry weight correction. Sample RDLs are highly matrix-dependent.

Surrogate: An organic compound which is similar to the target analyte(s) in chemical composition and behavior in the analytical process, but which is not normally found in environmental samples. These compounds are spiked into all blanks, standards, and samples prior to analysis. Percent recoveries are calculated for each surrogate.

Continuing Calibration Verification: The calibration relationship established during the initial calibration must be verified at periodic intervals. Concentrations, intervals, and criteria are method specific.

Validated by:  
Rebecca Merz



SPECTRUM ANALYTICAL, INC.  
Featuring  
HANIBAL TECHNOLOGY

# Chain of Custody Record/Field Test Data Sheets for Air Analyses

Page 1 of 1

SB 891600JCH  
Special Handling:

Standard TAT - 7 to 10 business days  
 Rush TAT - Date Needed: \_\_\_\_\_

• All TATs subject to laboratory approval.  
• Min. 24-hour notification needed for rushes.

Report To: Kevin Scott		Invoice To: SAME		Project No.: 103X9022		Analysis		Matrix									
Tetra Tech, INC				Site Name: MICH. GAS UTIL.		24 HR TAT		Indoor / Ambient Air									
1 S. Wacker Dr. 37th Floor				Location: Coldwater State: MI		5 DAY TAT		Soil Gas									
Chicago, IL 60606				Sampler(s): Kevin Scott		To-15 Low Level											
Tel #: 856 217 6072		Attn:		SAMPLER: VADIM PETROV													
Project Manager: Kevin Scott		P.O. No.:		RQN:													
Can ID	Can Size (L)	Outgoing Canister Pressure ("Hg) (Lab)	Incoming Canister Pressure ("Hg) (Lab)	Flow Controller Readout (ml/min)	Lab ID:	Sample Id:	Sample Date(s)	Time Start (24 hr clock)	Time Stop (24 hr clock)	Canister Pressure in Field ("Hg) (Start)	Canister Pressure in Field ("Hg) (Stop)	Interior Temp. (F) (Start)	Interior Temp. (F) (Stop)				
0666	6	-30		3.09	SB891600-01	MGU-SV-5	5/15/14	10:25	0907	-27.5	-1	66	57				
0488	6	-30		3.16		MGU-SV-2	5/15/14	10:20	0909	-29	-0.5	66	57				
0207	6	-30		3.13		MGU-OA-1	5/15/14	10:34	0851	-28	-2						
0242	6	-30		3.07		MGU-SV-4	5/15/14	10:22	0950	-31	-22	66	59				
0675	6	-30		3.14		MGU-SV-1	5/15/14	10:18	0904	-27	-1	66	57				
0280	6	-30		3.19		MGU-IA-1	5/15/14	10:24	0907	28.5	0	66	57				
0274	6	-30		3.13		MGU-IA-2	5/15/14	10:18	0904	28	0	66	57				
4626	6	-30		3.08		MGU-SV-3	5/15/14	10:21	0910	-31	-11.5	66	57				
Date of Request: 5/13/14		Total # Canisters: 8		QA/QC Reporting Level:		23.7/10/23.7 IR (AMB)		Client Use		Ambient Temperature (Fahrenheit)		Ambient Pressure (inches of Hg)					
Requested by: Kevin Scott		# LL Canisters: 8		<input checked="" type="checkbox"/> Standard		<input type="checkbox"/> NY ASP A*		Start		48							
Company: Tetra Tech		# Flow Controllers: 8		<input type="checkbox"/> NO QC		<input type="checkbox"/> NY ASP B*		Stop									
Location: Coldwater, MI		Flow Rate/Setting: 24hrs		<input type="checkbox"/> DQA*		* additional charges may apply contact SA's QA Department for further info.											
Date Needed: 5/14/14		Order #: 31254		Prepared by: BRP		Special Instructions/QC Requirements & Comments:											
I attest that all media relinquished from Spectrum Analytical, Inc. have been received in good working condition, based on visual observation, and agree to the terms and conditions as listed on the back of this document.		Signed: K Scott		Date: 5/15/14		VACUUM GAUGE FOR CAN ID 4626 - Initial reading -4" Hg @ start											
Printed: KEVIN SCOTT						SAMPLE DATES: START 5/15/14 END: 5/16/14											
						24-Hour TAT NEEDED FOR MGU-IA-1 + MGU-IA-2; 5 DAY TAT for ALL OTHERS											
						Please contact SA's Air Department immediately at (800) 789-9115 if you experience any technical difficulties or suspect any QC issue(s) with air media.											
Relinquished by: K Scott		Received by: FedEx		Date: 5/16/14		Time: 10:00		<input type="checkbox"/> EDD Format		EPA Region 2							
FedEx		OME		5/19/14				<input type="checkbox"/> E-mail Results to		KEVIN.SCOTT@TETRATECH.COM							

From: (302) 283-2256  
Kevin Scott  
Tetra Tech EM Inc.  
240 Continental Drive  
Ste 200  
Newark, DE 19713

Origin ID: ILGA



Ship Date: 16MAY14  
ActWgt: 25.0 LB  
CAD: 7709497/INET3490

Delivery Address Bar Code



SHIP TO: (413) 789-9018  
**Sample Custodian**  
**Spectrum Analytical, Inc.**  
**11 Almgren Drive**

BILL SENDER

Ref # 103X90260001S051405006  
Invoice #  
PO #  
Dept #

AGAWAM, MA 01001

1 of 2

**SATURDAY 12:00P**  
**PRIORITY OVERNIGHT**

TRK# 7700 0197 6825

0201

## MASTER ##

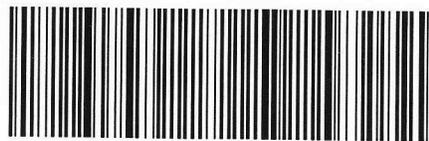
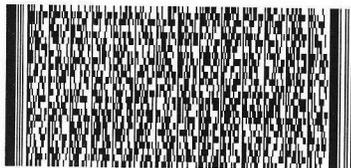
**X0 EHTA**

DSR

01001

MA-US

BDL



522G1A2D3F220

**After printing this label:**

1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

**Warning:** Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.

Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on [fedex.com](http://fedex.com). FedEx will not be responsible for any claim in excess of \$100 per package, whether the result of loss, damage, delay, non-delivery, misdelivery or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim. Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental, consequential, or special is limited to the greater of \$100 or the authorized declared value. Recovery cannot exceed actual documented loss. Maximum for items of extraordinary value is \$1,000, e.g. jewelry, precious metals, negotiable instruments and other items listed in our ServiceGuide. Written claims must be filed within strict time limits, see current FedEx Service Guide.



**SPECTRUM ANALYTICAL, INC.**  
*Featuring*  
**HANIBAL TECHNOLOGY**

11 Almgren Drive  
Agawam, MA 01001  
(413) 789-9018

This preceding chain of custody has been amended to include the client requested additional analyses as noted below:

<i>Laboratory ID</i>	<i>Client ID</i>	<i>Analysis</i>	<i>Added</i>
SB89600-06	MGU-IA-1	Volatile Organics in Air	5/20/2014
SB89600-07	MGU-IA-2	Volatile Organics in Air	5/20/2014

Report Date:  
30-May-14 11:19



- Final Report
- Re-Issued Report
- Revised Report

**SPECTRUM ANALYTICAL, INC.**  
*Featuring*  
**HANIBAL TECHNOLOGY**  
**Laboratory Report**

Tetra Tech, Inc  
1 S. Wacker Drive 37th Floor  
Chicago, IL 60606  
Attn: Kevin Scott

Project: See Chain of Custody  
Project #: 103X902600

<u>Laboratory ID</u>	<u>Client Sample ID</u>	<u>Container</u>	<u>Matrix</u>	<u>Date Sampled</u>	<u>Date Received</u>
SB89526-01	MGU-SG-1	Tedlar Bag	Soil Gas	15-May-14 13:18	16-May-14 10:10
SB89526-02	MGU-SG-2	Tedlar Bag	Soil Gas	15-May-14 13:22	16-May-14 10:10
SB89526-03	MGU-SG-3	Tedlar Bag	Soil Gas	15-May-14 13:45	16-May-14 10:10

I attest that the information contained within the report has been reviewed for accuracy and checked against the quality control requirements for each method. These results relate only to the sample(s) as received.  
All applicable NELAC requirements have been met.

Massachusetts # M-MA138/MA1110  
Connecticut # PH-0777  
Florida # E87600/E87936  
Maine # MA138  
New Hampshire # 2538  
New Jersey # MA011/MA012  
New York # 11393/11840  
Pennsylvania # 68-04426/68-02924  
Rhode Island # 98  
USDA # S-51435



Authorized by:

Nicole Leja  
Laboratory Director

Spectrum Analytical holds certification in the State of New York for the analytes as indicated with an X in the "Cert." column within this report. Please note that the State of New York does not offer certification for all analytes. Please refer to our website for specific certification holdings in each state.

Please note that this report contains 14 pages of analytical data plus Chain of Custody document(s). When the Laboratory Report is indicated as revised, this report supersedes any previously dated reports for the laboratory ID(s) referenced above. Where this report identifies subcontracted analyses, copies of the subcontractor's test report are available upon request. This report may not be reproduced, except in full, without written approval from Spectrum Analytical, Inc.

*Spectrum Analytical, Inc. is a NELAC accredited laboratory organization and meets NELAC testing standards. Use of the NELAC logo however does not insure that Spectrum is currently accredited for the specific method or analyte indicated. Please refer to our "Quality" web page at [www.spectrum-analytical.com](http://www.spectrum-analytical.com) for a full listing of our current certifications and fields of accreditation. States in which Spectrum Analytical, Inc. holds NELAC certification are New York, New Hampshire, New Jersey, Pennsylvania and Florida. All analytical work for Volatile Organic and Air analysis are transferred to and conducted at our 830 Silver Street location (NY-11840, NJ-MA012, PA-68-04426 and FL-E87936).*

*Please contact the Laboratory or Technical Director at 800-789-9115 with any questions regarding the data contained in this laboratory report.*

**CASE NARRATIVE:**

Data has been reported to the RDL. This report excludes estimated concentrations detected below the RDL and above the MDL (J-Flag).

Samples are received and the pressure is recorded from the gauge on the canister. If a canister does not have a gauge, a vacuum gauge is attached to the valve and pressure is recorded. If the canister is below -10 psig, the can must be pressurized to 0 psig. Tedlar bags do not have the pressure recorded. The can pressure can be located within this report in the sample header information.

If a Duplicate (DUP) was not requested on the Chain of Custody, method criteria may have been fulfilled with a source sample not of this Sample Delivery Group.

May 30, 2014 Report Revision Case Narrative:

This report has been revised to correct client information.

**See below for any non-conformances and issues relating to quality control samples and/or sample analysis/matrix.**

**EPA TO-15**

**Calibration:**

1404030

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Analyte quantified by quadratic equation type calibration.

1,1-Dichloroethene  
Methylene chloride

This affected the following samples:

1411239-BLK1  
1411239-BS1  
MGU-SG-1  
MGU-SG-2  
MGU-SG-3  
S403730-ICV1  
S405395-CCV1

Calibration 1404030

---

The %RSD for analyte Ethanol is 30.9%. The calculated %RSD for the RRF for each compound in the calibration must be less than 30% with at most two exceptions up to a limit of 40%. This affected the following samples:

MGU-SG-1  
MGU-SG-2  
MGU-SG-3

**Laboratory Control Samples:**

1411239 BS

---

1,2,4-Trichlorobenzene percent recovery 141 (70-130) is outside individual acceptance criteria, but within overall method allowances. All reported results of the following samples are considered to have a potentially high bias:

MGU-SG-1  
MGU-SG-2  
MGU-SG-3

1411239-BS1

---

analyte passed in CCV1

1,2,4-Trichlorobenzene

**EPA TO-15**

**Samples:**

SB89526-01                    *MGU-SG-1*

---

Sample was collected in a Tedlar bag; recommended hold time is 48 hours. This media is not appropriate for ppbv level analysis.

SB89526-02                    *MGU-SG-2*

---

Sample was collected in a Tedlar bag; recommended hold time is 48 hours. This media is not appropriate for ppbv level analysis.

SB89526-03                    *MGU-SG-3*

---

Sample was collected in a Tedlar bag; recommended hold time is 48 hours. This media is not appropriate for ppbv level analysis.

## Sample Acceptance Check Form

Client: Tetra Tech, Inc - Chicago, IL  
 Project: See Chain of Custody / 103X902600  
 Work Order: SB89526  
 Sample(s) received on: 5/16/2014  
 Received by: Jessica Hoffman

*The following outlines the condition of samples for the attached Chain of Custody upon receipt.*

	<u>Yes</u>	<u>No</u>	<u>N/A</u>
1. Were custody seals present?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Were custody seals intact?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3. Were samples received at a temperature of $\leq 6^{\circ}\text{C}$ ?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4. Were samples cooled on ice upon transfer to laboratory representative?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5. Were samples refrigerated upon transfer to laboratory representative?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
6. Were sample containers received intact?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Were samples properly labeled (labels affixed to sample containers and include sample ID, site location, and/or project number and the collection date)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Were samples accompanied by a Chain of Custody document?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Does Chain of Custody document include proper, full, and complete documentation, which shall include sample ID, site location, and/or project number, date and time of collection, collector's name, preservation type, sample matrix and any special remarks concerning the sample?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
10. Did sample container labels agree with Chain of Custody document?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Were samples received within method-specific holding times?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Sample Identification

MGU-SG-1  
SB89526-01

Client Project #  
103X902600

Matrix  
Soil Gas

Collection Date/Time  
15-May-14 13:18

Received  
16-May-14

<u>CAS No.</u>	<u>Analyte(s)</u>	<u>Result/Units</u>	<u>*RDL</u>	<u>Result ug/m<sup>3</sup></u>	<u>*RDL</u>	<u>Flag</u>	<u>Method Ref.</u>	<u>Analyzed</u>	<u>Analyst</u>	<u>Batch</u>	<u>Cert.</u>
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**Air Quality Analyses**

Volatile Organics in Air

ppbv

Prepared 16-May-14  
Dilution: 1

TB

115-07-1	Propene	< 0.500	0.500	< 0.86	0.86		EPA TO-15	16-May-14	BRF	1411239	
75-71-8	Dichlorodifluoromethane (Freon12)	<b>0.500</b>	0.500	<b>2.47</b>	2.47		"	"	"	"	X
74-87-3	Chloromethane	<b>0.760</b>	0.500	<b>1.57</b>	1.03		"	"	"	"	X
76-14-2	1,2-Dichlorotetrafluoroethane (Freon 114)	< 0.500	0.500	< 3.49	3.49		"	"	"	"	X
75-01-4	Vinyl chloride	< 0.500	0.500	< 1.28	1.28		"	"	"	"	X
106-99-0	1,3-Butadiene	< 0.500	0.500	< 1.10	1.10		"	"	"	"	X
74-83-9	Bromomethane	< 0.500	0.500	< 1.94	1.94		"	"	"	"	X
75-00-3	Chloroethane	< 0.500	0.500	< 1.32	1.32		"	"	"	"	X
67-64-1	Acetone	<b>7.14</b>	0.500	<b>16.97</b>	1.19		"	"	"	"	X
75-69-4	Trichlorofluoromethane (Freon 11)	< 0.500	0.500	< 2.81	2.81		"	"	"	"	X
64-17-5	Ethanol	<b>7.95</b>	0.500	<b>14.99</b>	0.94		"	"	"	"	
107-13-1	Acrylonitrile	< 0.500	0.500	< 1.08	1.08		"	"	"	"	X
75-35-4	1,1-Dichloroethene	< 0.500	0.500	< 1.98	1.98		"	"	"	"	X
75-09-2	Methylene chloride	<b>0.500</b>	0.500	<b>1.74</b>	1.74		"	"	"	"	X
76-13-1	1,1,2-Trichlorotrifluoroethane (Freon 113)	< 0.500	0.500	< 3.83	3.83		"	"	"	"	X
75-15-0	Carbon disulfide	< 0.500	0.500	< 1.56	1.56		"	"	"	"	X
156-60-5	trans-1,2-Dichloroethene	< 0.500	0.500	< 1.98	1.98		"	"	"	"	X
75-34-3	1,1-Dichloroethane	< 0.500	0.500	< 2.02	2.02		"	"	"	"	X
1634-04-4	Methyl tert-butyl ether	< 0.500	0.500	< 1.80	1.80		"	"	"	"	X
67-63-0	Isopropyl alcohol	<b>1.55</b>	0.500	<b>3.80</b>	1.23		"	"	"	"	X
78-93-3	2-Butanone (MEK)	< 0.500	0.500	< 1.47	1.47		"	"	"	"	X
156-59-2	cis-1,2-Dichloroethene	< 0.500	0.500	< 1.98	1.98		"	"	"	"	X
110-54-3	Hexane	< 0.500	0.500	< 1.76	1.76		"	"	"	"	X
141-78-6	Ethyl acetate	< 0.500	0.500	< 1.80	1.80		"	"	"	"	
67-66-3	Chloroform	< 0.500	0.500	< 2.43	2.43		"	"	"	"	X
109-99-9	Tetrahydrofuran	< 0.500	0.500	< 1.47	1.47		"	"	"	"	
107-06-2	1,2-Dichloroethane	< 0.500	0.500	< 2.02	2.02		"	"	"	"	X
71-55-6	1,1,1-Trichloroethane	< 0.500	0.500	< 2.73	2.73		"	"	"	"	X
71-43-2	Benzene	< 0.500	0.500	< 1.60	1.60		"	"	"	"	X
56-23-5	Carbon tetrachloride	< 0.500	0.500	< 3.15	3.15		"	"	"	"	X
110-82-7	Cyclohexane	< 0.500	0.500	< 1.72	1.72		"	"	"	"	X
78-87-5	1,2-Dichloropropane	< 0.500	0.500	< 2.31	2.31		"	"	"	"	X
75-27-4	Bromodichloromethane	< 0.500	0.500	< 3.35	3.35		"	"	"	"	X
79-01-6	Trichloroethene	< 0.500	0.500	< 2.69	2.69		"	"	"	"	X
123-91-1	1,4-Dioxane	< 0.500	0.500	< 1.80	1.80		"	"	"	"	X
142-82-5	n-Heptane	< 0.500	0.500	< 2.05	2.05		"	"	"	"	X
108-10-1	4-Methyl-2-pentanone (MIBK)	< 0.500	0.500	< 2.05	2.05		"	"	"	"	X
10061-01-5	cis-1,3-Dichloropropene	< 0.500	0.500	< 2.27	2.27		"	"	"	"	X
10061-02-6	trans-1,3-Dichloropropene	< 0.500	0.500	< 2.27	2.27		"	"	"	"	X
79-00-5	1,1,2-Trichloroethane	< 0.500	0.500	< 2.73	2.73		"	"	"	"	X
108-88-3	Toluene	<b>1.05</b>	0.500	<b>3.95</b>	1.88		"	"	"	"	X
591-78-6	2-Hexanone (MBK)	< 0.500	0.500	< 2.05	2.05		"	"	"	"	
124-48-1	Dibromochloromethane	< 0.500	0.500	< 4.26	4.26		"	"	"	"	X
106-93-4	1,2-Dibromoethane (EDB)	< 0.500	0.500	< 3.84	3.84		"	"	"	"	X

*This laboratory report is not valid without an authorized signature on the cover page.*

Sample Identification

MGU-SG-1  
SB89526-01

Client Project #  
103X902600

Matrix  
Soil Gas

Collection Date/Time  
15-May-14 13:18

Received  
16-May-14

<u>CAS No.</u>	<u>Analyte(s)</u>	<u>Result/Units</u>	<u>*RDL</u>	<u>Result ug/m<sup>3</sup></u>	<u>*RDL</u>	<u>Flag</u>	<u>Method Ref.</u>	<u>Analyzed</u>	<u>Analyst</u>	<u>Batch</u>	<u>Cert.</u>
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**Air Quality Analyses**

Volatile Organics in Air

ppbv

Prepared 16-May-14  
Dilution: 1

TB

127-18-4	Tetrachloroethene	< 0.500	0.500	< 3.39	3.39		EPA TO-15	16-May-14	BRF	1411239	X
108-90-7	Chlorobenzene	< 0.500	0.500	< 2.30	2.30		"	"	"	"	X
630-20-6	1,1,1,2-Tetrachloroethane	< 0.500	0.500	< 3.44	3.44		"	"	"	"	
100-41-4	Ethylbenzene	< 0.500	0.500	< 2.17	2.17		"	"	"	"	X
179601-23-1	m,p-Xylene	< 1.00	1.00	< 4.34	4.34		"	"	"	"	X
75-25-2	Bromoform	< 0.500	0.500	< 5.17	5.17		"	"	"	"	X
100-42-5	Styrene	< 0.500	0.500	< 2.13	2.13		"	"	"	"	X
95-47-6	o-Xylene	< 0.500	0.500	< 2.17	2.17		"	"	"	"	X
79-34-5	1,1,2,2-Tetrachloroethane	< 0.500	0.500	< 3.43	3.43		"	"	"	"	X
98-82-8	Isopropylbenzene	< 0.500	0.500	< 2.46	2.46		"	"	"	"	X
108-67-8	1,3,5-Trimethylbenzene	< 0.500	0.500	< 2.46	2.46		"	"	"	"	X
622-96-8	4-Ethyltoluene	< 0.500	0.500	< 2.46	2.46		"	"	"	"	
95-63-6	1,2,4-Trimethylbenzene	< 0.500	0.500	< 2.46	2.46		"	"	"	"	X
91-20-3	Naphthalene	< 0.500	0.500	< 2.62	2.62		"	"	"	"	X
541-73-1	1,3-Dichlorobenzene	< 0.500	0.500	< 3.01	3.01		"	"	"	"	X
100-44-7	Benzyl chloride	< 0.500	0.500	< 2.58	2.58		"	"	"	"	X
106-46-7	1,4-Dichlorobenzene	< 0.500	0.500	< 3.01	3.01		"	"	"	"	X
135-98-8	sec-Butylbenzene	< 0.500	0.500	< 2.74	2.74		"	"	"	"	
99-87-6	4-Isopropyltoluene	< 0.500	0.500	< 2.68	2.68		"	"	"	"	
95-50-1	1,2-Dichlorobenzene	< 0.500	0.500	< 3.01	3.01		"	"	"	"	X
104-51-8	n-Butylbenzene	< 0.500	0.500	< 2.74	2.74		"	"	"	"	
120-82-1	1,2,4-Trichlorobenzene	< 0.500	0.500	< 3.71	3.71		"	"	"	"	X
87-68-3	Hexachlorobutadiene	< 0.500	0.500	< 5.33	5.33		"	"	"	"	X

Surrogate recoveries:

460-00-4	4-Bromofluorobenzene	92		70-130 %			"	"	"	"	
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Sample Identification

MGU-SG-2  
SB89526-02

Client Project #  
103X902600

Matrix  
Soil Gas

Collection Date/Time  
15-May-14 13:22

Received  
16-May-14

<u>CAS No.</u>	<u>Analyte(s)</u>	<u>Result/Units</u>	<u>*RDL</u>	<u>Result ug/m<sup>3</sup></u>	<u>*RDL</u>	<u>Flag</u>	<u>Method Ref.</u>	<u>Analyzed</u>	<u>Analyst</u>	<u>Batch</u>	<u>Cert.</u>
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**Air Quality Analyses**

<u>Volatile Organics in Air</u>		<u>ppbv</u>	<u>Prepared 16-May-14</u>				<u>TB</u>				
			<u>Dilution: 1</u>								
115-07-1	Propene	< 0.500	0.500	< 0.86	0.86		EPA TO-15	17-May-14	BRF	1411239	
75-71-8	Dichlorodifluoromethane (Freon12)	< 0.500	0.500	< 2.47	2.47		"	"	"	"	X
74-87-3	Chloromethane	<b>0.670</b>	0.500	<b>1.38</b>	1.03		"	"	"	"	X
76-14-2	1,2-Dichlorotetrafluoroethane (Freon 114)	< 0.500	0.500	< 3.49	3.49		"	"	"	"	X
75-01-4	Vinyl chloride	< 0.500	0.500	< 1.28	1.28		"	"	"	"	X
106-99-0	1,3-Butadiene	< 0.500	0.500	< 1.10	1.10		"	"	"	"	X
74-83-9	Bromomethane	< 0.500	0.500	< 1.94	1.94		"	"	"	"	X
75-00-3	Chloroethane	< 0.500	0.500	< 1.32	1.32		"	"	"	"	X
67-64-1	Acetone	<b>8.66</b>	0.500	<b>20.58</b>	1.19		"	"	"	"	X
75-69-4	Trichlorofluoromethane (Freon 11)	< 0.500	0.500	< 2.81	2.81		"	"	"	"	X
64-17-5	Ethanol	<b>9.04</b>	0.500	<b>17.04</b>	0.94		"	"	"	"	
107-13-1	Acrylonitrile	< 0.500	0.500	< 1.08	1.08		"	"	"	"	X
75-35-4	1,1-Dichloroethene	< 0.500	0.500	< 1.98	1.98		"	"	"	"	X
75-09-2	Methylene chloride	<b>1.53</b>	0.500	<b>5.31</b>	1.74		"	"	"	"	X
76-13-1	1,1,2-Trichlorotrifluoroethane (Freon 113)	< 0.500	0.500	< 3.83	3.83		"	"	"	"	X
75-15-0	Carbon disulfide	< 0.500	0.500	< 1.56	1.56		"	"	"	"	X
156-60-5	trans-1,2-Dichloroethene	< 0.500	0.500	< 1.98	1.98		"	"	"	"	X
75-34-3	1,1-Dichloroethane	< 0.500	0.500	< 2.02	2.02		"	"	"	"	X
1634-04-4	Methyl tert-butyl ether	< 0.500	0.500	< 1.80	1.80		"	"	"	"	X
67-63-0	Isopropyl alcohol	<b>1.51</b>	0.500	<b>3.71</b>	1.23		"	"	"	"	X
78-93-3	2-Butanone (MEK)	< 0.500	0.500	< 1.47	1.47		"	"	"	"	X
156-59-2	cis-1,2-Dichloroethene	< 0.500	0.500	< 1.98	1.98		"	"	"	"	X
110-54-3	Hexane	<b>0.500</b>	0.500	<b>1.76</b>	1.76		"	"	"	"	X
141-78-6	Ethyl acetate	< 0.500	0.500	< 1.80	1.80		"	"	"	"	
67-66-3	Chloroform	< 0.500	0.500	< 2.43	2.43		"	"	"	"	X
109-99-9	Tetrahydrofuran	< 0.500	0.500	< 1.47	1.47		"	"	"	"	
107-06-2	1,2-Dichloroethane	< 0.500	0.500	< 2.02	2.02		"	"	"	"	X
71-55-6	1,1,1-Trichloroethane	< 0.500	0.500	< 2.73	2.73		"	"	"	"	X
71-43-2	Benzene	< 0.500	0.500	< 1.60	1.60		"	"	"	"	X
56-23-5	Carbon tetrachloride	< 0.500	0.500	< 3.15	3.15		"	"	"	"	X
110-82-7	Cyclohexane	< 0.500	0.500	< 1.72	1.72		"	"	"	"	X
78-87-5	1,2-Dichloropropane	< 0.500	0.500	< 2.31	2.31		"	"	"	"	X
75-27-4	Bromodichloromethane	< 0.500	0.500	< 3.35	3.35		"	"	"	"	X
79-01-6	Trichloroethene	< 0.500	0.500	< 2.69	2.69		"	"	"	"	X
123-91-1	1,4-Dioxane	< 0.500	0.500	< 1.80	1.80		"	"	"	"	X
142-82-5	n-Heptane	< 0.500	0.500	< 2.05	2.05		"	"	"	"	X
108-10-1	4-Methyl-2-pentanone (MIBK)	< 0.500	0.500	< 2.05	2.05		"	"	"	"	X
10061-01-5	cis-1,3-Dichloropropene	< 0.500	0.500	< 2.27	2.27		"	"	"	"	X
10061-02-6	trans-1,3-Dichloropropene	< 0.500	0.500	< 2.27	2.27		"	"	"	"	X
79-00-5	1,1,2-Trichloroethane	< 0.500	0.500	< 2.73	2.73		"	"	"	"	X
108-88-3	Toluene	<b>0.930</b>	0.500	<b>3.50</b>	1.88		"	"	"	"	X
591-78-6	2-Hexanone (MBK)	< 0.500	0.500	< 2.05	2.05		"	"	"	"	
124-48-1	Dibromochloromethane	< 0.500	0.500	< 4.26	4.26		"	"	"	"	X
106-93-4	1,2-Dibromoethane (EDB)	< 0.500	0.500	< 3.84	3.84		"	"	"	"	X

*This laboratory report is not valid without an authorized signature on the cover page.*

Sample Identification

MGU-SG-2  
SB89526-02

Client Project #  
103X902600

Matrix  
Soil Gas

Collection Date/Time  
15-May-14 13:22

Received  
16-May-14

<u>CAS No.</u>	<u>Analyte(s)</u>	<u>Result/Units</u>	<u>*RDL</u>	<u>Result ug/m<sup>3</sup></u>	<u>*RDL</u>	<u>Flag</u>	<u>Method Ref.</u>	<u>Analyzed</u>	<u>Analyst</u>	<u>Batch</u>	<u>Cert.</u>
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**Air Quality Analyses**

<u>Volatile Organics in Air</u>		<u>ppbv</u>	<u>Prepared 16-May-14</u>				<u>TB</u>				
			<u>Dilution: 1</u>								
127-18-4	Tetrachloroethene	< 0.500	0.500	< 3.39	3.39		EPA TO-15	17-May-14	BRF	1411239	X
108-90-7	Chlorobenzene	< 0.500	0.500	< 2.30	2.30		"	"	"	"	X
630-20-6	1,1,1,2-Tetrachloroethane	< 0.500	0.500	< 3.44	3.44		"	"	"	"	
100-41-4	Ethylbenzene	< 0.500	0.500	< 2.17	2.17		"	"	"	"	X
179601-23-1	m,p-Xylene	< 1.00	1.00	< 4.34	4.34		"	"	"	"	X
75-25-2	Bromoform	< 0.500	0.500	< 5.17	5.17		"	"	"	"	X
100-42-5	Styrene	< 0.500	0.500	< 2.13	2.13		"	"	"	"	X
95-47-6	o-Xylene	< 0.500	0.500	< 2.17	2.17		"	"	"	"	X
79-34-5	1,1,2,2-Tetrachloroethane	< 0.500	0.500	< 3.43	3.43		"	"	"	"	X
98-82-8	Isopropylbenzene	< 0.500	0.500	< 2.46	2.46		"	"	"	"	X
108-67-8	1,3,5-Trimethylbenzene	< 0.500	0.500	< 2.46	2.46		"	"	"	"	X
622-96-8	4-Ethyltoluene	< 0.500	0.500	< 2.46	2.46		"	"	"	"	
95-63-6	1,2,4-Trimethylbenzene	< 0.500	0.500	< 2.46	2.46		"	"	"	"	X
91-20-3	Naphthalene	< 0.500	0.500	< 2.62	2.62		"	"	"	"	X
541-73-1	1,3-Dichlorobenzene	< 0.500	0.500	< 3.01	3.01		"	"	"	"	X
100-44-7	Benzyl chloride	< 0.500	0.500	< 2.58	2.58		"	"	"	"	X
106-46-7	1,4-Dichlorobenzene	< 0.500	0.500	< 3.01	3.01		"	"	"	"	X
135-98-8	sec-Butylbenzene	< 0.500	0.500	< 2.74	2.74		"	"	"	"	
99-87-6	4-Isopropyltoluene	< 0.500	0.500	< 2.68	2.68		"	"	"	"	
95-50-1	1,2-Dichlorobenzene	< 0.500	0.500	< 3.01	3.01		"	"	"	"	X
104-51-8	n-Butylbenzene	< 0.500	0.500	< 2.74	2.74		"	"	"	"	
120-82-1	1,2,4-Trichlorobenzene	< 0.500	0.500	< 3.71	3.71		"	"	"	"	X
87-68-3	Hexachlorobutadiene	< 0.500	0.500	< 5.33	5.33		"	"	"	"	X

Surrogate recoveries:

460-00-4	4-Bromofluorobenzene	92		70-130 %			"	"	"	"	
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Sample Identification

MGU-SG-3  
SB89526-03

Client Project #  
103X902600

Matrix  
Soil Gas

Collection Date/Time  
15-May-14 13:45

Received  
16-May-14

<u>CAS No.</u>	<u>Analyte(s)</u>	<u>Result/Units</u>	<u>*RDL</u>	<u>Result ug/m<sup>3</sup></u>	<u>*RDL</u>	<u>Flag</u>	<u>Method Ref.</u>	<u>Analyzed</u>	<u>Analyst</u>	<u>Batch</u>	<u>Cert.</u>
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**Air Quality Analyses**

Volatile Organics in Air

ppbv

Prepared 16-May-14  
Dilution: 1

TB

115-07-1	Propene	< 0.500	0.500	< 0.86	0.86		EPA TO-15	17-May-14	BRF	1411239	
75-71-8	Dichlorodifluoromethane (Freon12)	< 0.500	0.500	< 2.47	2.47		"	"	"	"	X
74-87-3	Chloromethane	<b>0.660</b>	0.500	<b>1.36</b>	1.03		"	"	"	"	X
76-14-2	1,2-Dichlorotetrafluoroethane (Freon 114)	< 0.500	0.500	< 3.49	3.49		"	"	"	"	X
75-01-4	Vinyl chloride	< 0.500	0.500	< 1.28	1.28		"	"	"	"	X
106-99-0	1,3-Butadiene	< 0.500	0.500	< 1.10	1.10		"	"	"	"	X
74-83-9	Bromomethane	< 0.500	0.500	< 1.94	1.94		"	"	"	"	X
75-00-3	Chloroethane	< 0.500	0.500	< 1.32	1.32		"	"	"	"	X
67-64-1	Acetone	<b>8.25</b>	0.500	<b>19.60</b>	1.19		"	"	"	"	X
75-69-4	Trichlorofluoromethane (Freon 11)	< 0.500	0.500	< 2.81	2.81		"	"	"	"	X
64-17-5	Ethanol	<b>14.9</b>	0.500	<b>28.09</b>	0.94		"	"	"	"	
107-13-1	Acrylonitrile	< 0.500	0.500	< 1.08	1.08		"	"	"	"	X
75-35-4	1,1-Dichloroethene	< 0.500	0.500	< 1.98	1.98		"	"	"	"	X
75-09-2	Methylene chloride	<b>2.52</b>	0.500	<b>8.75</b>	1.74		"	"	"	"	X
76-13-1	1,1,2-Trichlorotrifluoroethane (Freon 113)	< 0.500	0.500	< 3.83	3.83		"	"	"	"	X
75-15-0	Carbon disulfide	< 0.500	0.500	< 1.56	1.56		"	"	"	"	X
156-60-5	trans-1,2-Dichloroethene	< 0.500	0.500	< 1.98	1.98		"	"	"	"	X
75-34-3	1,1-Dichloroethane	< 0.500	0.500	< 2.02	2.02		"	"	"	"	X
1634-04-4	Methyl tert-butyl ether	< 0.500	0.500	< 1.80	1.80		"	"	"	"	X
67-63-0	Isopropyl alcohol	<b>2.00</b>	0.500	<b>4.91</b>	1.23		"	"	"	"	X
78-93-3	2-Butanone (MEK)	< 0.500	0.500	< 1.47	1.47		"	"	"	"	X
156-59-2	cis-1,2-Dichloroethene	< 0.500	0.500	< 1.98	1.98		"	"	"	"	X
110-54-3	Hexane	<b>0.530</b>	0.500	<b>1.87</b>	1.76		"	"	"	"	X
141-78-6	Ethyl acetate	< 0.500	0.500	< 1.80	1.80		"	"	"	"	
67-66-3	Chloroform	< 0.500	0.500	< 2.43	2.43		"	"	"	"	X
109-99-9	Tetrahydrofuran	< 0.500	0.500	< 1.47	1.47		"	"	"	"	
107-06-2	1,2-Dichloroethane	< 0.500	0.500	< 2.02	2.02		"	"	"	"	X
71-55-6	1,1,1-Trichloroethane	< 0.500	0.500	< 2.73	2.73		"	"	"	"	X
71-43-2	Benzene	< 0.500	0.500	< 1.60	1.60		"	"	"	"	X
56-23-5	Carbon tetrachloride	< 0.500	0.500	< 3.15	3.15		"	"	"	"	X
110-82-7	Cyclohexane	< 0.500	0.500	< 1.72	1.72		"	"	"	"	X
78-87-5	1,2-Dichloropropane	< 0.500	0.500	< 2.31	2.31		"	"	"	"	X
75-27-4	Bromodichloromethane	< 0.500	0.500	< 3.35	3.35		"	"	"	"	X
79-01-6	Trichloroethene	< 0.500	0.500	< 2.69	2.69		"	"	"	"	X
123-91-1	1,4-Dioxane	< 0.500	0.500	< 1.80	1.80		"	"	"	"	X
142-82-5	n-Heptane	< 0.500	0.500	< 2.05	2.05		"	"	"	"	X
108-10-1	4-Methyl-2-pentanone (MIBK)	< 0.500	0.500	< 2.05	2.05		"	"	"	"	X
10061-01-5	cis-1,3-Dichloropropene	< 0.500	0.500	< 2.27	2.27		"	"	"	"	X
10061-02-6	trans-1,3-Dichloropropene	< 0.500	0.500	< 2.27	2.27		"	"	"	"	X
79-00-5	1,1,2-Trichloroethane	< 0.500	0.500	< 2.73	2.73		"	"	"	"	X
108-88-3	Toluene	<b>1.07</b>	0.500	<b>4.03</b>	1.88		"	"	"	"	X
591-78-6	2-Hexanone (MBK)	< 0.500	0.500	< 2.05	2.05		"	"	"	"	
124-48-1	Dibromochloromethane	< 0.500	0.500	< 4.26	4.26		"	"	"	"	X
106-93-4	1,2-Dibromoethane (EDB)	< 0.500	0.500	< 3.84	3.84		"	"	"	"	X

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Sample Identification

MGU-SG-3  
SB89526-03

Client Project #  
103X902600

Matrix  
Soil Gas

Collection Date/Time  
15-May-14 13:45

Received  
16-May-14

<u>CAS No.</u>	<u>Analyte(s)</u>	<u>Result/Units</u>	<u>*RDL</u>	<u>Result ug/m<sup>3</sup></u>	<u>*RDL</u>	<u>Flag</u>	<u>Method Ref.</u>	<u>Analyzed</u>	<u>Analyst</u>	<u>Batch</u>	<u>Cert.</u>
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**Air Quality Analyses**Volatile Organics in Air

ppbv

Prepared 16-May-14  
Dilution: 1

TB

127-18-4	Tetrachloroethene	< 0.500	0.500	< 3.39	3.39		EPA TO-15	17-May-14	BRF	1411239	X
108-90-7	Chlorobenzene	< 0.500	0.500	< 2.30	2.30		"	"	"	"	X
630-20-6	1,1,1,2-Tetrachloroethane	< 0.500	0.500	< 3.44	3.44		"	"	"	"	
100-41-4	Ethylbenzene	< 0.500	0.500	< 2.17	2.17		"	"	"	"	X
179601-23-1	m,p-Xylene	< 1.00	1.00	< 4.34	4.34		"	"	"	"	X
75-25-2	Bromoform	< 0.500	0.500	< 5.17	5.17		"	"	"	"	X
100-42-5	Styrene	< 0.500	0.500	< 2.13	2.13		"	"	"	"	X
95-47-6	o-Xylene	< 0.500	0.500	< 2.17	2.17		"	"	"	"	X
79-34-5	1,1,2,2-Tetrachloroethane	< 0.500	0.500	< 3.43	3.43		"	"	"	"	X
98-82-8	Isopropylbenzene	< 0.500	0.500	< 2.46	2.46		"	"	"	"	X
108-67-8	1,3,5-Trimethylbenzene	< 0.500	0.500	< 2.46	2.46		"	"	"	"	X
622-96-8	4-Ethyltoluene	< 0.500	0.500	< 2.46	2.46		"	"	"	"	
95-63-6	1,2,4-Trimethylbenzene	< 0.500	0.500	< 2.46	2.46		"	"	"	"	X
91-20-3	Naphthalene	< 0.500	0.500	< 2.62	2.62		"	"	"	"	X
541-73-1	1,3-Dichlorobenzene	< 0.500	0.500	< 3.01	3.01		"	"	"	"	X
100-44-7	Benzyl chloride	< 0.500	0.500	< 2.58	2.58		"	"	"	"	X
106-46-7	1,4-Dichlorobenzene	< 0.500	0.500	< 3.01	3.01		"	"	"	"	X
135-98-8	sec-Butylbenzene	< 0.500	0.500	< 2.74	2.74		"	"	"	"	
99-87-6	4-Isopropyltoluene	< 0.500	0.500	< 2.68	2.68		"	"	"	"	
95-50-1	1,2-Dichlorobenzene	< 0.500	0.500	< 3.01	3.01		"	"	"	"	X
104-51-8	n-Butylbenzene	< 0.500	0.500	< 2.74	2.74		"	"	"	"	
120-82-1	1,2,4-Trichlorobenzene	< 0.500	0.500	< 3.71	3.71		"	"	"	"	X
87-68-3	Hexachlorobutadiene	< 0.500	0.500	< 5.33	5.33		"	"	"	"	X

Surrogate recoveries:

460-00-4	4-Bromofluorobenzene	93		70-130 %			"	"	"	"	
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**Air Quality Analyses - Quality Control**

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch 1411239 - General Air Prep</b>										
<u>Blank (1411239-BLK1)</u>						<u>Prepared &amp; Analyzed: 16-May-14</u>				
Propene	< 0.500		ppbv	0.500						
Dichlorodifluoromethane (Freon12)	< 0.500		ppbv	0.500						
Chloromethane	< 0.500		ppbv	0.500						
1,2-Dichlorotetrafluoroethane (Freon 114)	< 0.500		ppbv	0.500						
Vinyl chloride	< 0.500		ppbv	0.500						
1,3-Butadiene	< 0.500		ppbv	0.500						
Bromomethane	< 0.500		ppbv	0.500						
Chloroethane	< 0.500		ppbv	0.500						
Acetone	< 0.500		ppbv	0.500						
Trichlorofluoromethane (Freon 11)	< 0.500		ppbv	0.500						
Ethanol	< 0.500		ppbv	0.500						
Acrylonitrile	< 0.500		ppbv	0.500						
1,1-Dichloroethene	< 0.500		ppbv	0.500						
Methylene chloride	< 0.500		ppbv	0.500						
1,1,2-Trichlorotrifluoroethane (Freon 113)	< 0.500		ppbv	0.500						
Carbon disulfide	< 0.500		ppbv	0.500						
trans-1,2-Dichloroethene	< 0.500		ppbv	0.500						
1,1-Dichloroethane	< 0.500		ppbv	0.500						
Methyl tert-butyl ether	< 0.500		ppbv	0.500						
Isopropyl alcohol	< 0.500		ppbv	0.500						
2-Butanone (MEK)	< 0.500		ppbv	0.500						
cis-1,2-Dichloroethene	< 0.500		ppbv	0.500						
Hexane	< 0.500		ppbv	0.500						
Ethyl acetate	< 0.500		ppbv	0.500						
Chloroform	< 0.500		ppbv	0.500						
Tetrahydrofuran	< 0.500		ppbv	0.500						
1,2-Dichloroethane	< 0.500		ppbv	0.500						
1,1,1-Trichloroethane	< 0.500		ppbv	0.500						
Benzene	< 0.500		ppbv	0.500						
Carbon tetrachloride	< 0.500		ppbv	0.500						
Cyclohexane	< 0.500		ppbv	0.500						
1,2-Dichloropropane	< 0.500		ppbv	0.500						
Bromodichloromethane	< 0.500		ppbv	0.500						
Trichloroethene	< 0.500		ppbv	0.500						
1,4-Dioxane	< 0.500		ppbv	0.500						
n-Heptane	< 0.500		ppbv	0.500						
4-Methyl-2-pentanone (MIBK)	< 0.500		ppbv	0.500						
cis-1,3-Dichloropropene	< 0.500		ppbv	0.500						
trans-1,3-Dichloropropene	< 0.500		ppbv	0.500						
1,1,2-Trichloroethane	< 0.500		ppbv	0.500						
Toluene	< 0.500		ppbv	0.500						
2-Hexanone (MBK)	< 0.500		ppbv	0.500						
Dibromochloromethane	< 0.500		ppbv	0.500						
1,2-Dibromoethane (EDB)	< 0.500		ppbv	0.500						
Tetrachloroethene	< 0.500		ppbv	0.500						
Chlorobenzene	< 0.500		ppbv	0.500						
1,1,1,2-Tetrachloroethane	< 0.500		ppbv	0.500						
Ethylbenzene	< 0.500		ppbv	0.500						
m,p-Xylene	< 1.00		ppbv	1.00						
Bromoform	< 0.500		ppbv	0.500						
Styrene	< 0.500		ppbv	0.500						
o-Xylene	< 0.500		ppbv	0.500						

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**Air Quality Analyses - Quality Control**

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch 1411239 - General Air Prep</b>										
<b>Blank (1411239-BLK1)</b>					<u>Prepared &amp; Analyzed: 16-May-14</u>					
1,1,2,2-Tetrachloroethane	< 0.500		ppbv	0.500						
Isopropylbenzene	< 0.500		ppbv	0.500						
1,3,5-Trimethylbenzene	< 0.500		ppbv	0.500						
4-Ethyltoluene	< 0.500		ppbv	0.500						
1,2,4-Trimethylbenzene	< 0.500		ppbv	0.500						
Naphthalene	< 0.500		ppbv	0.500						
1,3-Dichlorobenzene	< 0.500		ppbv	0.500						
Benzyl chloride	< 0.500		ppbv	0.500						
1,4-Dichlorobenzene	< 0.500		ppbv	0.500						
sec-Butylbenzene	< 0.500		ppbv	0.500						
4-Isopropyltoluene	< 0.500		ppbv	0.500						
1,2-Dichlorobenzene	< 0.500		ppbv	0.500						
n-Butylbenzene	< 0.500		ppbv	0.500						
1,2,4-Trichlorobenzene	< 0.500		ppbv	0.500						
Hexachlorobutadiene	< 0.500		ppbv	0.500						
<i>Surrogate: 4-Bromofluorobenzene</i>	9.15		ppbv		10.0		92	70-130		
<b>LCS (1411239-BS1)</b>					<u>Prepared &amp; Analyzed: 16-May-14</u>					
Propene	8.50		ppbv		10.0		85	70-130		
Dichlorodifluoromethane (Freon12)	8.43		ppbv		10.0		84	70-130		
Chloromethane	8.72		ppbv		10.0		87	70-130		
1,2-Dichlorotetrafluoroethane (Freon 114)	8.73		ppbv		10.0		87	70-130		
Vinyl chloride	8.85		ppbv		10.0		88	70-130		
1,3-Butadiene	8.86		ppbv		10.0		89	70-130		
Bromomethane	8.62		ppbv		10.0		86	70-130		
Chloroethane	8.47		ppbv		10.0		85	70-130		
Acetone	8.64		ppbv		10.0		86	70-130		
Trichlorofluoromethane (Freon 11)	10.1		ppbv		10.0		101	70-130		
Ethanol	8.89		ppbv		10.0		89	70-130		
Acrylonitrile	8.35		ppbv		10.0		84	50-150		
1,1-Dichloroethene	10.2		ppbv		10.0		102	70-130		
Methylene chloride	10.2		ppbv		10.0		102	70-130		
1,1,2-Trichlorotrifluoroethane (Freon 113)	10.1		ppbv		10.0		101	70-130		
Carbon disulfide	8.44		ppbv		10.0		84	70-130		
trans-1,2-Dichloroethene	8.30		ppbv		10.0		83	70-130		
1,1-Dichloroethane	7.94		ppbv		10.0		79	70-130		
Methyl tert-butyl ether	7.66		ppbv		10.0		77	70-130		
Isopropyl alcohol	9.85		ppbv		10.0		98	70-130		
2-Butanone (MEK)	7.67		ppbv		10.0		77	70-130		
cis-1,2-Dichloroethene	8.10		ppbv		10.0		81	70-130		
Hexane	8.41		ppbv		10.0		84	70-130		
Ethyl acetate	8.32		ppbv		10.0		83	70-130		
Chloroform	8.15		ppbv		10.0		82	70-130		
Tetrahydrofuran	7.54		ppbv		10.0		75	70-130		
1,2-Dichloroethane	8.21		ppbv		10.0		82	70-130		
1,1,1-Trichloroethane	8.37		ppbv		10.0		84	70-130		
Benzene	7.72		ppbv		10.0		77	70-130		
Carbon tetrachloride	9.00		ppbv		10.0		90	70-130		
Cyclohexane	7.86		ppbv		10.0		79	70-130		
1,2-Dichloropropane	8.22		ppbv		10.0		82	70-130		
Bromodichloromethane	8.74		ppbv		10.0		87	70-130		
Trichloroethene	8.71		ppbv		10.0		87	70-130		

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**Air Quality Analyses - Quality Control**

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch 1411239 - General Air Prep</b>										
<u>LCS (1411239-BS1)</u>								<u>Prepared &amp; Analyzed: 16-May-14</u>		
1,4-Dioxane	8.46		ppbv		10.0		85	50-150		
n-Heptane	8.53		ppbv		10.0		85	70-130		
4-Methyl-2-pentanone (MIBK)	8.84		ppbv		10.0		88	70-130		
cis-1,3-Dichloropropene	8.21		ppbv		10.0		82	70-130		
trans-1,3-Dichloropropene	8.12		ppbv		10.0		81	70-130		
1,1,2-Trichloroethane	8.39		ppbv		10.0		84	70-130		
Toluene	8.32		ppbv		10.0		83	70-130		
2-Hexanone (MBK)	8.27		ppbv		10.0		83	70-130		
Dibromochloromethane	9.61		ppbv		10.0		96	70-130		
1,2-Dibromoethane (EDB)	8.75		ppbv		10.0		88	70-130		
Tetrachloroethene	9.74		ppbv		10.0		97	70-130		
Chlorobenzene	9.45		ppbv		10.0		94	70-130		
1,1,1,2-Tetrachloroethane	8.58		ppbv		10.0		86	50-150		
Ethylbenzene	8.66		ppbv		10.0		87	70-130		
m,p-Xylene	18.4		ppbv		20.0		92	70-130		
Bromoform	10.6		ppbv		10.0		106	70-130		
Styrene	8.79		ppbv		10.0		88	70-130		
o-Xylene	9.45		ppbv		10.0		94	70-130		
1,1,2,2-Tetrachloroethane	8.84		ppbv		10.0		88	70-130		
Isopropylbenzene	7.79		ppbv		10.0		78	50-150		
1,3,5-Trimethylbenzene	8.90		ppbv		10.0		89	70-130		
4-Ethyltoluene	8.92		ppbv		10.0		89	70-130		
1,2,4-Trimethylbenzene	9.02		ppbv		10.0		90	70-130		
Naphthalene	9.41		ppbv		10.0		94	50-150		
1,3-Dichlorobenzene	10.2		ppbv		10.0		102	70-130		
Benzyl chloride	11.1		ppbv		10.0		111	70-130		
1,4-Dichlorobenzene	10.1		ppbv		10.0		101	70-130		
sec-Butylbenzene	8.23		ppbv		10.0		82	50-150		
4-Isopropyltoluene	8.51		ppbv		10.0		85	50-150		
1,2-Dichlorobenzene	9.88		ppbv		10.0		99	70-130		
n-Butylbenzene	8.34		ppbv		10.0		83	50-150		
1,2,4-Trichlorobenzene	14.1	Z-2	ppbv		10.0		141	70-130		
Hexachlorobutadiene	12.6		ppbv		10.0		126	70-130		
Surrogate: 4-Bromofluorobenzene	9.16		ppbv		10.0		92	70-130		

*This laboratory report is not valid without an authorized signature on the cover page.*

## Notes and Definitions

TB	Sample was collected in a Tedlar bag; recommended hold time is 48 hours. This media is not appropriate for ppbv level analysis.
Z-2	analyte passed in CCV1
dry	Sample results reported on a dry weight basis
NR	Not Reported
RPD	Relative Percent Difference

Laboratory Control Sample (LCS): A known matrix spiked with compound(s) representative of the target analytes, which is used to document laboratory performance.

Matrix Duplicate: An intra-laboratory split sample which is used to document the precision of a method in a given sample matrix.

Matrix Spike: An aliquot of a sample spiked with a known concentration of target analyte(s). The spiking occurs prior to sample preparation and analysis. A matrix spike is used to document the bias of a method in a given sample matrix.

Method Blank: An analyte-free matrix to which all reagents are added in the same volumes or proportions as used in sample processing. The method blank should be carried through the complete sample preparation and analytical procedure. The method blank is used to document contamination resulting from the analytical process.

Method Detection Limit (MDL): The minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero and is determined from analysis of a sample in a given matrix type containing the analyte.

Reportable Detection Limit (RDL): The lowest concentration that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions. For many analytes the RDL analyte concentration is selected as the lowest non-zero standard in the calibration curve. While the RDL is approximately 5 to 10 times the MDL, the RDL for each sample takes into account the sample volume/weight, extract/digestate volume, cleanup procedures and, if applicable, dry weight correction. Sample RDLs are highly matrix-dependent.

Surrogate: An organic compound which is similar to the target analyte(s) in chemical composition and behavior in the analytical process, but which is not normally found in environmental samples. These compounds are spiked into all blanks, standards, and samples prior to analysis. Percent recoveries are calculated for each surrogate.

Continuing Calibration Verification: The calibration relationship established during the initial calibration must be verified at periodic intervals. Concentrations, intervals, and criteria are method specific.

Validated by:



From: (302) 283-2256  
Jennifer Johnson  
Tetra Tech EM Inc.  
240 Continental Drive  
Ste 200  
Newark, DE 19713

Origin ID: ILGA



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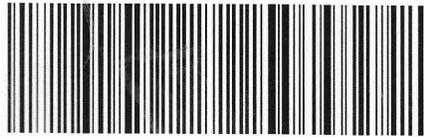
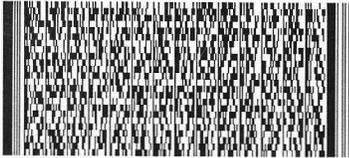
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